July 29, 2011

Ms. Denise Goddard
United States Environmental Protection Agency
Science and Ecosystem Support Division
980 College Station Road
Athens, GA 30605-2720

Subject: Data Review and Validation

Site Name: Smokey Mountain Smelter, Knoxville, TN

Project No.: DG-0725

ELEMENT Sample ID. Nos: NA

Inorganic Analysis: Spectrum Analytical, Tampa, FL

Date(s) Sampled: 05/02 - 12/11

VTSR Date: 05/20/11

Date Received from Lab: 07/08/11

TDF No. 10T1637

Dear Ms. Goddard:

The ESAT Work Team has reviewed the above-captioned data package consisting of adequate deliverables to document EPA Methods SM5220D for COD; SW9060 for TOC and dissolved organic carbon; SW300.1 for chloride, nitrate, nitrite, ortho-phosphate, and sulfate; E350.1 for ammonia; E351.2 for total Kjeldahl nitrogen (TKN); SW7196A for hexavalent chromium; and E160.1 for TDS for twenty-six soil samples and thirteen water samples according to EPA guidelines. This package presents acceptable technical performance and generally met the standard for quality required by Region 4 except as detailed below.

Examination of laboratory blank samples revealed apparent low-level contamination with several analytes. Reported detection limits were adjusted as high as ten times the blank levels to discount possible false positives due to contamination in the method blanks.

Several pairs of field duplicates were taken during this sampling effort. The results were evaluated by calculation of relative percent difference (RPD) and where they exceeded Region 4 SOP guidelines, it is noted below. It is Region 4 policy not to qualify data based on field duplicate precision and this data is provided for informational purposes only. Matrix precision for field duplicates was outside of control limits for TOC (110 RPD) and ammonia (39 RPD) in soil in SDG 3502795.

Dilutions for nitrate and nitrite were analyzed outside of holding times for sample SMSGWJ08. Original and diluted results are provided and the results from the dilution are considered estimated and "J" qualified.

Matrix spike recoveries were below control limits for fluoride (10%), nitrite (10%), ortho-phosphate (5%), sulfate (70%), and TKN (59%). The results for fluoride, nitrite, sulfate, and TKN in sample SMSSD08 were considered estimated and "J" qualified. The ortho-phosphate result in sample SMSSD08 was considered unusable and "R" qualified.

Matrix precision was outside of control limits (78 RPD) for nitrite for sample SMSSD08. The nitrite result for sample SMSSD08 was considered estimated and "J" qualified.

A Stage 4 validation consisting of manual review of QC summary data was performed on the samples submitted for this case.

Further details are provided in the attached review summary form. Please feel free to contact this office if we can be of further service.

Very truly yours,

Sue Jones

Senior Inorganic Data Reviewer Integrated Laboratory Systems

Sue Jenés

Approved:

Stephen L. Pilcher

Region 4 ESAT Team Manager Integrated Laboratory Systems

Inorganic Data Quality Assessment Record (DQAR)

Review Date:	07/29/11	Analyses:	COD, TOC, DOC, NH3, NO3, NO2, Cr+6, CI, FI, PO4, SO4, TKN, TDS	Matrix:	Water & Soil	Project #:	DG-0725
SDG/Lab Fi	ile:	3502918, 3	502773, 3502961, 35	02852, 3502	795, 3502823		
Laboratory		Spectrum A	Analytical, Tampa,	FL			
Site Name:		Smokey M	ountain Smelter, Ki	noxville, TN			
Check One:		EPA	ESAT (CLP	Other (specify)	Non-CLP (RAS)	

Signatures: \$1

<u>SJ____</u>

Reviewer

Review Codes: M- Metals, H- Mercury, C- Cyanide, O- Others

	Sample Numbers:	
Water:	Soil/Sediment:	
SMSSW01 - SMSSW10	SMSSD01	SMSSFC13
SMSSW04D	SMSSD03 - 10	SMSSFJ04
SMSSW08SPRING	SMSSD04D	SMSSFL04
SMSSW09SPRING	SMSSBJ10-17.5 – 23	SMSSFI04
	SMSSBJ09-10 - 15	SMSSFM06
	SMSSBJ08-13 – 17	SMSSFM04
	SMSGWJ08-21	SMSSBJ07
	SMSSFF15	
	SMSSFE15	
	SMSSFH05	
V.14- 13- 14- 14- 14- 14- 14- 14- 14- 14- 14- 14	SMSSFH95	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	SMSSFE13	

I. SUMMARY OF PROBLEMS AND COMMENTS:

A summary of deficiencies noted for the methods used to generate data for this project is presented below. Please refer to the Data Quality Assessment Record (DQAR) for each data file and the data flag summary table at the end of this review document. For the purposes of this review, the QC limits specified in the analytical method have been applied to the data. Data qualifier recommendations are made in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (Functional Guidelines), and the Region 4 SOP, Data Validation Standard Operating Procedures for Contract Laboratory Program Routine Analytical Services (R4DVSOP).

Data Review Comments:

- 1. Matrix spike recoveries were low for Fl, NO2, PO4, SO4, TKN in sample SMSSD08.
- 2. Matrix precision was over control limits for NO2 in sample SMSSD08.
- 3. Holding times were missed for dilutions for NO3 and NO2 in sample SMSGWJ08.

	II. Data Quality Assessment (An explanation for any "no" answer must be provided)		14.700 300 32	
1.	Summary	Yes	N/A	No
	Were all requested analyses performed?	О	M,H	
	Were all required QC checks performed?	О	M,H	
	Were all required documents present?	О	M,H	
	Were requested detection limits met?	?		

Remark: Required detection limits are unknown.

2.	Holding Times:(Holding times are not applicable for non-aqueous samples)	Yes	N/A	No
	Were water samples properly preserved?	О	M,H	
	Were water holding time requirements met?		M,H	О
	Remark: Holding times were missed for dilutions for NO3 and NO2 in sample SMSC	iW108		

3.	Calibrations:	Yes	N/A	No
	A. Initial Calibration:	2555		
	Were acceptable correlation coefficients obtained?	О	M.H	A CONTRACTOR OF THE PARTY OF TH
5	Were acceptable % Recoveries for analytes obtained?	O	1	
	B. Continuing Calibration			ALC: THE
	Were acceptable % Recoveries for analytes obtained?	0	M.H	ATTENDED IN COLUMN
	Remark:			
	Blanks:	Yes	NI/A	No
•				NO
·····	Were any contaminants noted in the blanks?	0		··········
	If yes, were blank rules applied to the data?		M,H	
	Remark: 10X rule applied			
	ICP Interference Check Sample:	Yes	N/A	No
	Were results within 20% of the true value?		м,н,о	
	Were False positives Reported?		м,н,о	
	Were False negatives reported?		M,H,O	
	Remark:			
	Matrix spikes:	Yes	N/A	No
	Was a matrix spike analysis performed?	0	M.H	
·	Were samples spiked at appropriate levels?	0		
	Were matrix spike/matrix spike duplicate analyses performed?			
*******	Were acceptable recoveries obtained?		+	О
	Was acceptable precision obtained?			0
	Remark: MS recovery low for Fl, NO2, PO4, SO4, and TKN. RPD high for I	NO2.	1	
			1	
•	Matrix duplicate analysis:	Yes		No
	Was a matrix duplicate analysis performed?	0	M,H M,H M,H M,H M,H M,H M,H,O M,H,O M,H,O M,H,O M,H,H M,H M,H M,H M,H M,H M,H M,H M,H M	
	Was duplicate precision in control?			0
	Remark: RPD outside of control limits for TOC and NO2 in field duplicates.			
	Performance Evaluation Sample:	Yes	N/A	No
	Was a P.E. Sample analyzed with the samples?		M,H	O
	If yes, were acceptable results obtained?			
	Remark:			
•	Method Standard / Laboratory Control Sample:	Yes	N/A	No
	Were acceptable recoveries obtained?	О	M.H	
	Was acceptable precision obtained?			
	Remark:			
0.	ICP Serial Dilution Sample:	Yes	N/A	No

	Were diluted results within 10% of undiluted sample result?			
	Remark:			
11	Completeness:	Yes	N/A	No
11.	Were all requested analyses performed?	О	M,H	
	Were all required documents present? If yes, were results provided?	О	M,H	
~	Were results of calculation checks acceptable?	О	М,Н	
	Remark:			

Additional Comments:

III. Data Qualifiers Summary

Based on a review of the quality control information, the following is a table summarizing the data qualifiers used by Region IV for this data review report.

		Recommended	Data Qualifiers			
Case	NA	Project Number:	DG-0725	i i	NT Sample Nos.	NA
Site	Smokey	Mountain Smelters, Kn	noxville, TN Da		ate:	07/29/11
Affected Samples		Analytes	Recommended	Qualifiers		Reason
SMSSD08	FI, NO	2, PO4, SO4, TKN	J, OM-1		Low MS recovery	
SMSSD08	NO2		J, QM-4		High RPD	
SMSGWJ08	NO3 a	nd NO2	J, H-1		Holding times missed for dilution.	
SMSSD08	PO4		R, QM-6		MS recover	y < 10%

May 21, 2014

Ms. Denise Goddard United States Environmental Protection Agency Science and Ecosystem Support Division 980 College Station Road Athens, GA 30605-2720

Subject: Data Review and Validation

Site Name: Smokey Mountain Smelters, Knoxville, TN

Project No.: DG-0520

ELEMENT Sample ID. Nos: NA

Inorganic Analysis: Spectrum Analytical, Tampa, FL Date(s) Sampled: 6/3 - 5/2013 and 6/26 - 28/2012

VTSR Date: 6/6/2013 and 6/29/2012

Date Received from Lab: TDF No.: 14T0546

Dear Ms. Goddard:

The ESAT Work Team has reviewed the above-captioned data package consisting of adequate deliverables to document EPA Methods E310.1 for alkalinity; E350.1 for ammonia; E300.1 for ortho-phosphate, fluoride, chloride, and sulfate; E353.2 for nitrate and nitrite, and E160.1 for total dissolved solids (TDS) for twenty water samples according to EPA guidelines. This package presents acceptable technical performance and generally met the standard for quality required by Region 4 except as detailed below.

Examination of laboratory blank samples revealed apparent low-level contamination with nitrate/nitrite. Reported detection limits were adjusted as high as ten times the blank levels to discount possible false positives due to contamination in the method blanks.

Holding times were missed for ortho-phosphate for all samples in SDG 3506439. Four of the samples were received out of holding times in this SDG.

A Stage 4 validation consisting of manual review was performed on the inorganic samples submitted for this case.

Further details are provided in the attached review summary form. Please feel free to contact this office if we can be of further service.

Very truly yours,

Sue Jones Chemist

Alion Science and Technology ESAT Contractor, Region 4 EPA

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Inorganic Data Quality Assessment Record (DQAR)

Review Date:	5/19/14	Analyses:	NO3, NO2, PO4, SO4, F, Cl, NH3, Alk., TDS	Matrix:	Water	Project #:	DG-0520
SDG/L	ab File:		3509413 ai	rd 3506439	<u> </u>		
Labor	ratory			Spectrum A	nalytical, Tampa, FL	· · · · · · · · · · · · · · · · · · ·	
Site N	Vame:		Smol	key Mountai	in Smelters, Knoxville	e, TN	
Check	One:	EPA	ESAT	CLP	Other (specify)	Non-CLP	(RAS)

Signatures: SJ

Reviewer

Review Codes: M- Metals, H- Mercury, C- Cyanide, O- Others

SMSMW02A SMSMW07A	Soil/Sediment:	
SMSMW07A		
	<u> </u>	
SMSMW07B		,
SMSMW08A		
ŚMSMW901A		
SMSMW903B		
SMSMW10A – both sdgs		
SMSRB062812		
SMSMW13A		
SMSMW911B		
	SMSMW08A SMSMW901A SMSMW903B SMSMW10A – both sdgs SMSRB062812 SMSMW13A	SMSMW08A SMSMW901A SMSMW903B SMSMW10A – both sdgs SMSRB062812 SMSMW13A

I. SUMMARY OF PROBLEMS AND COMMENTS:

A summary of deficiencies noted for the methods used to generate data for this project is presented below. Please refer to the Data Quality Assessment Record (DQAR) for each data file and the data flag summary table at the end of this review document. For the purposes of this review, the QC limits specified in the analytical method have been applied to the data. Data qualifier recommendations are made in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (Functional Guidelines), and the Region 4 SOP, Data Validation Standard Operating Procedures for Contract Laboratory Program Routine Analytical Services (R4DVSOP).

Data Review Comments:

	II. Data Quality Assessment (An explanation for any "no" answer must be provided)			
1.	Summary	Yes	N/A	No
	Were all requested analyses performed?	0		
	Were all required QC checks performed?	0		
	Were all required documents present?	0		
	Were requested detection limits met?	?		
Rem	ark: Project required detection limits are unknown.			
2.	Holding Times:(Holding times are not applicable for non-aqueous samples)	Yes	N/A	No
	Were water samples properly preserved?	0		
	Were water holding time requirements met?	0		0
	Remark: Holding times for o-phosphate were missed in SDG 3506439. Samples were "J	" qualified.		l

3.	Calibrations:	. Yes	N/A	No
•	A. Initial Calibration:			
	Were acceptable correlation coefficients obtained?	O	***************************************	0.000
	Were acceptable % Recoveries for analytes obtained?	0	alytes which a N/A O O O N/A	
	B. Continuing Calibration	State Palmar		
	Were acceptable % Recoveries for analytes obtained?	O		\$10,000 and 100,000
	Remark: Evaluation was performed according to the laboratory calibration lift of the +- 10% customarily used for metals evaluation.	mits for these non-CLP and	lytes which a	re outsid
<u>. </u>	Blanks:	Yes	N/A	No
	Were any contaminants noted in the blanks?	0		0
	If yes, were blank rules applied to the data?	0		
	Remark: 10X rule applied			
5.	ICP Interference Check Sample:	Yes	N/A	No
) .	Were results within 20% of the true value?	103		1
	Were False positives Reported?			
5.	Were False negatives reported?	·		
	Remark:	<u> </u>	U	
	Remark.		·	
<u>.</u>	Matrix spikes:	Yes	N/A	No
	Was a matrix spike analysis performed?			0
· · · · · · · · · · · · · · · · · · ·	Were samples spiked at appropriate levels?			0
	Were matrix spike/matrix spike duplicate analyses performed?			0
	Were acceptable recoveries obtained?			0
	Was acceptable precision obtained?			0
	Remark: There were no samples identified for MS/MSD analysis. LCS/LCS precision information.	D recoveries and RPDs we	re used for ac	curacy a
<u>. </u>	Matrix duplicate analysis:	Yes	N/A	No
•	Was a matrix duplicate analysis performed?			0
	Was duplicate precision in control?		0	Ĭ
	Remark: LCS/LCSD recoveries and RPDs were used for accuracy and precis	sion information.		1
<u> </u>	Performance Evaluation Sample (PES):	Yes	N/A	No
3.	Was a P.E.S. analyzed with the samples?		11/21	0
	If yes, were acceptable results obtained?			0
	Remark:			
	Remark.		<u> </u>	
•	Method Standard / Laboratory Control Sample:	Yes	N/A	No
	Were acceptable recoveries obtained?	0		
	Was acceptable precision obtained?	0		
	Remark:			

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0.	ICP Serial Dilution Sample:	Yes	N/A	No	
	Was ICP serial dilution analysis performed?			0	
	Were diluted results within 10% of undiluted sample result?		0		
	Remark:				
11.	Completeness:	Yes	N/A	No	
	Were all requested analyses performed?	0			
	Were all required documents present? If yes, were results provided?	O			
	Were results of calculation checks acceptable?	0			
	Remark:				
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Additional Comments:

III. Data Qualifiers Summary

Based on a review of the quality control information, the following is a table summarizing the data qualifiers used by Region 4 for this data review report.

		Recommended	Data Qualifiers			
		Project Number:	DG-0520 ELEMEN		NT Sample NA	
Site	Site Smokey Mountain Smelters,		oxville, TN	Da	ate:	5/21/2014
Affected Samples		Analytes	Recommended	Qualifiers		Reason
SMSMW02A, SMSMW08A, SMSMW10A	Fluoride		J, CLP02		Value repo	orted exceeded range
SMSMW01A, SMSMW901A, SMSMW02A, SMSMW03B, SMSMW903B, SMSMW04A, SMSMW07A. SMSMW07B, SMSMW08A, SMSMW10A, SMSMW10B, SMSRB062812			J, H-1		Holding tir	ne missed
SMSMW02A, SMSRB062812	Sulfate		J, Q-2		Concentrat	ion <rl and="">MDL</rl>
SMSMW10B	Ammonia	à	J, Q-2		Concentrat	ion <rl and="">MDL</rl>
SMSRB062812	Chloride		J, Q-2		Concentrat	ion <rl and="">MDL</rl>
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1 INORGANIC ANALYSIS DATA SHEET

						Er'A Sample No.	
Lab Name:	Spectrum Analyt	cal, Inc.	Contract:	Smokey Mountain	Smelter 073-0	SMSMW01A	
Lab Code :	PEL	Case No.:	إحكا وورودو وورودو وأرب وجوالحاططت كاث	SAS No:		DG No.: 3506439	
Matrix: W	ATER	u		Lab Sample ID:	350643901	متدوسيور	
Level:(low/me	d) LOW			Date Received:	6/29/2012	والمراجعة والمستعد والمستعدد والمستعد والمستعدد والمستعد والمستعدد والمستعد والمستعدد	
PercentSolids	: 0			Station ID:	The second secon		

CONCENTRATION UNITS: MG/L

Surrogate

CAS NO.	ANALYTE	Concentration	С	Q	М	į	MDL	RL
47752-0-60-0	Alkalinity (Total)	710			IS		5	10
7664-41-7	Ammonia	252			AS		0.02	0.25
7782-41-4	Fluoride	10	U		IC		3.3	10
1-00-5	Nitrate + Nitrite	109			AS		0.0022	0.1
14265-44-2	ortho-Phosphate-P	10	U5	H-1	IC		2.4	10

Control Limits

Dichloroacetate - DCA	93.2	90 - 115	
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Color Before:	Clarity Before:	Texture :	•
Color After:	Clarity After:	Artifacts:	-
Comments:			

Recovery

Qualifier

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INORGANIC ANALYSIS DATA SHEET

			Li A Gample No.
Lab Name: Spec	trum Analytical, Inc. Co	ontract: Smokey Mountain S	Smelter 073-0 SMSMW01ADL1
Lab Code: PEL	Case No.:	SAS No:	SDG No.: 3506439
Matrix: WATER	PPAPPENNI vi sklažiti obrazila za krizistick	Lab Sample ID:	350643901DL1
	LOW	Date Received:	6/29/2012
PercentSolids: 0		Station ID:	Affiliar / mid Affiliands compagners as a laguage of the days. The Affiliar Vol. 12 Medicards between the mail damages or compagners and the second of the s

CONCENTRATION UNITS: MG/L

Surrogate

CAS NO.	ANALYTE	Concentration	С	Q	М	MDL	RL
1-00-3	Chloride	19900			IC	170	500
3-03-5	Sulfate	913		-	IC	160	500

Dichloroacetate - DCA	96.0	90 - 115	_
Color Before:	Clarity Before:	Texture :	
Color After:	Clarity After:	Artifacts:	
Comments:			

Recovery

Control Limits

Qualifier

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INORGANIC ANALYSIS DATA SHEET

							EPA Sample	NO.
Lab Name:	Spectrum Analytical, Inc.		Contract:	Smokey Mountain		SMSMW901A		
Lab Code:	PEL	Case No.:		SAS No:	POT BARRA SALIKENI WINDOWSKY SE KAND JUN SA PREMIER	SDG No.:	3506439	Madellacion of Malling and Palabian Ch
Matrix: V	VATER			Lab Sample ID:	350643902	nites in the subsequent		
Level:(low/me	ed) LOW			Date Received:	6/29/2012	na managaran (h. 1811)		Miller a Aura balain - Jilana - v
PercentSolid	s: <u>0</u>			Station ID:				
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CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	С	Q	М	MDL	RL
47752-0-60-0	Alkalinity (Total)	760			IS	 5	10
7664-41-7	Ammonia	278			AS	0.02	0.25
7782-41-4	Fluoride	10	Ú		IC	3.3	10
1-00-5	Nitrate + Nitrite	113			AS	0.0022	0.1
14265-44-2	ortho-Phosphate-P	10	U.T	. H-1	C	2.4	10

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	92.8	90 - 115	
Color Before:	Clarity Before:	Texture :	

Color After :	Clarity After:	Artifacts:
Comments:		

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INORGANIC ANALYSIS DATA SHEET

							EPA Sample No),
Lab Name:	Spectrum Analyl	ical, Inc. C	ontract: Smok	ey Mountain :	Smelter 073-0		SMSMW901AD	L1
Lab Code :	PEL	Case No.:	SAS	No:	<u></u> S	DG No.:	3506439	F-11P-OF-C-MARIOMETERS
Matrix: V	VATER	·	Lab	Sample ID:	350643902DL1			,
Level:(low/me	ed) LOW		Date	Received:	6/29/2012		برمای داده داد داده داده داده داده داده داد	
PercentSolid	s: 0		Statio	on ID:				

CONCENTRATION UNITS: MG/L

Surrogate

CAS NO.	ANALYTE	Concentration	O	Q	М	MDL	RL
1-00-3	Chloride	20300			IC	170	500
3-03-5	Sulfate	931			IC	160	500

Dichloroacetate - DCA	94.4	90 - 115	
Color Before:	Clarity Before:	Texture :	
Color After :	Clarity After:	Artifacts:	
Comments:			
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Recovery

Control Limits

Qualifier

INORGANIC ANALYSIS DATA SHEET

					LI A Cample No.
Lab Name:	Spectrum Analytic	cal, Inc. Contract:	Smokey Mountain	Smelter 073-0	SMSMW02A
Lab Code :	PEL	Case No.:	SAS No:	SDG	No.: 3506439
Matrix: W	ATER	·	Lab Sample ID:	350643903	
Level:(low/me	d) LOW		Date Received;	6/29/2012	. The state of th
PercentSolids	. 0	and the state of t	Station ID:	and where the same the same decreases and the same same part part of the same same same same same same same sam	

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	С	Q	М		MDL	RL
47752-0-60-0	Alkalinity (Total)	1270			IS	-	5	10
7664-41-7	Ammonia	78.3			AS		0.02	0.25
7782-41-4	Fluoride	266	J	CLPAZ	IC		3.3	10
1-00-5	Nitrate + Nitrite	-0.0138 · O. I	U X		AS		0.0022	0.1
14265-44-2	ortho-Phosphate-P	10	UJ	4-1	IC		2.4	10
3-03-5	Sulfate	5.3	J	0-2	IC	<u> </u>	3.2	10

Surrogate	Recovery	Control Limits	Qualifier		
Dichloroacetate - DCA	94.4	90 - 115			
Color Before:	Clarity Before:	Texture:			
Color After:	Clarity After:	Artifacts:	Artifacts:		
Comments:					

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Lab Name:	Spectrum Analy	rtical, Inc.	Contract:	Smokey Mounta	in Smelter 073-	0		fW02ADL1		
Lab Code :	PEL	Case No	وروس در در موسال می در از این در در	SAS No:		SDG No	350643	39		
Matrix: W	/ATER	e Daniel Salah		Lab Sample ID): 350643903E	DL1				
Level:(low/me	d) LOW	mM.		Date Received	6/29/2012					
PercentSolids	: 0	a area o volumento la malado (m		Station ID:			··		19-7	
CONCENTER	ATION UNITS:	MG/L		•						
CAS NO.	ANALYTE	IN G/E		Concentration	on C	Q	M		MDL	RL
-00-3	Chloride			3170			IC		34	100
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		,				·				
1	Surrogate	ı	Recovery	, I Cont	rol Limits	Qualifie	r l			

90 - 115

Color Before: _____ Clarity Before: ____ Texture : _____

Color After : ____ Clarity After: ____ Artifacts: _____

Comments:

96.0

Dichloroacetate - DCA

3506439

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INORGANIC ANALYSIS DATA SHEET

				•			EPA Sample No.	
Lab Name:	Spectrum Analytic	cal, Inc.	Contract:	Smokey Mountain	Smelter 073-0		SMSMW03B	
Lab Code :	PEL .	Case No.:	en af the SF- O _{Seaso}p inonfil	SAS No:	ngry u 18009-gangarandapprografisati	SDG No.:	3506439	-was-normal
Matrix: V	VATER	hankf ä		Lab Sample ID:	350643904	and the same of		
Level:(low/me	ed) LOW			Date Received:	6/29/2012	· · · · · · · · · · · · · · · · · · ·		
PercentSolids	s: 0			Station ID:		mare helicologic special acrisis a a pri		

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	С	Q	М	MDL	RL
47752-0-60-0	Alkalinity (Total)	535			IS	2.5	5
7664-41-7	Ammonia	59			AS	0.02	0.25
7782-41-4	Fluoride	10	U		IC	 3.3	10
1-00-5	Nitrate + Nitrite	-0.048 0.1	NY		AS	0.0022	0.1
14265-44-2	ortho-Phosphate-P	10	UJ	H-1	IC	2.4	10

Surrogate	Recovery	Control Limits	Qualifier		
Dichloroacetate - DCA	93.2	90 - 115			
	,				
		•			
Color Before;	Clarity Before:	Texture :	Texture :		
Color After :	Clarity After:	Artifacts:			
		<u>-</u>			
Comments:					

		II.	IORGANIC .	ANALYSIS DATA	SHEET					
•							EPA Sa	mple No.		*
Lab Name:	Spectrum Analyl	ical, Inc.	Contract:	Smokey Mountain	Smelter 073-0		SMSMV	V03BDL1		
Lab Code :	PEL	Case No.:	**************************************	SAS No:		SDG No	3506439	······································	WHEN ALBE	
Matrix: W	ATER	,		Lab Sample ID:	350643904D	L1				-
Level:(low/me	d) LOW			Date Received:	6/29/2012		and the second s			
PercentSolids	: 0	ra mharuspaterita		Station ID:			and the state of t			
	-						•			
CONCENTRA	ATION UNITS:	MG/L		·	,		,		,	· · ·
CAS NO.	ANALYTE			Concentration	С	Q	м		MDL	RL
-03-5	Sulfate			1540			IC .		160	500
			-							
						-				

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	94.0	90 - 115	

Color Before:	Clarity Before:	Texture :
Color After :	Clarity After:	Artifacts:
Comments:		

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		INORGANIC	ANALYSIS DATA	SHEET					
							Sample No.	 ,	
Lab Name:	Spectrum Analytical, Inc	Contract:	Smokey Mountain	Smelter 073-0		SMSI	MW03BDL2		
Lab Code :	PEL Case	No.:	SAS No:	Or to and the orea name of the filippy of the by	SDG No.:	35064	39	d accordinglying	
Matrix: W	ATER		Lab Sample ID:	350643904D	L2				
Level:(low/med	d) LOW		Date Received:	6/29/2012					
PercentSolids	: 0		Station ID:			-			
	to the second of the second se					**************	de fersion absorber of New Merchanism and an arrange		
							•		
CONCENTRA	TION UNITS: MG/L								
CAS NO.	ANALYTE		Concentration	· c	a	М		MDL	RL
1-00-3	Chloride		54400			IC	·	340	1000
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Dichloroace	Surrogate	Recovery 96.0		l Limits - 115	Qualifier				
Dichioroacci	Late DOA	00.0	1 30	-110		1			
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Color Before:	Cla	rity Before:	Tex	rture :					
Color After :	Cla	arity After:	hΑ	tifacts:				-	
Comments:		, <u></u>		,					

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INORGANIC ANALYSIS DATA SHEET

				Li A Gample No.
Lab Name:	Spectrum Analytical, Inc. Contract:	Smokey Mountain	Smelter 073-0	SMSMW903B
	EL Case No.:	SAS No:	SDG	No.: 3506439
	TER	Lab Sample ID:	350643905	
Level:(low/med)	LOW	Date Received:	6/29/2012	and the state of t
PercentSolids:	O . A 1 setting the Author and a contract of the Contract of t	Station ID:	A summary of the state of t	and the second s

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	С	Q.	M		MDL	RL
47752-0-60-0	Alkalinity (Total)	670			IS	· · · · · · · · · · · · · · · · · · ·	5	10
7664-41-7	Ammonia	53.3			AS		0.02	0.25
7782-41-4	Fluoride	10	U		IC		3.3	10
1-00-5	Nitrate + Nitrite	_0.0497- 0.1	K		AS		0.0022	0.1
14265-44-2	ortho-Phosphate-P	10	UJ	H-1	IC		2.4	10

Surrogate	•	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA		93.6	90 - 115	
			•	
Color Before:	Clarity Befo	re:	Texture :	
Color After :	Clarity Afte	r:	Artifacts:	·
Comments:				
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INORGANIC ANALYSIS DATA SHEET

Lab Name:	Spectrum Analyti	ical, Inc. Contrac	: Smokey Mountain	Smelter 073-0	SMSMW903BDL1
Lab Code :	PEL	Case No.:	SAS No:	SI	DG No.: 3506439
Matrix: V	VATER		Lab Sample ID:	350643905DL1	Mysens ib
Level:(low/me	ed) LOW		Date Received:	6/29/2012	
PercentSolids	B: <u>0</u>		Station ID:		
		·			
			•		
CONCENTR	ATION UNITS: N	MG/L			

Concentration

1530

EPA Sample No.

MDL

160

RL

500

Q

М

IC

С

٠	Surrogate	Recovery	Control Limits Qualifier		
	Dichloroacetate - DCA	93.2	90 - 115		

CAS NO.

3-03-5

ANALYTE

Sulfate

Color Before:	Clarity Before:	Texture :
Color After :	Clarity After:	Artifacts:
Comments:		

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	I	NORGANIC .	ANALYSIS DATA :	SHEET		EC			
•		٠			Γ		ample No.		
ii i oficial a madematical		Contract:	Smokey Mountain				W903BDL2		
Lab Code: PEL	Case No.:	-	SAS No:	بالأور برسورود وورافة برقوي الوسيسار ودووا	SDG No.:	350643	9		
Matrix: WATER	Abburrel plates (Marriella, buryant da survebbarla liste)		Lab Sample ID:	350643905D) <u>L2</u>				
Level:(low/med) LO	W		Date Received:	6/29/2012		distributions are a		380-1a1+47H	
PercentSolids: 0			Station ID:	position and the second	·				
	e e			•					
CONCENTRATION U	NITS: MG/L								Ţ·
CAS NO. ANAI	LYTE		Concentration	С	a	М		MDL	RL
1-00-3 Chlorid	le		54200			IC		340	1000
Surrog Dichloroacetate - DC		Recovery 97.8		I Limits - 115	Qualifier	_			
Color After:	Clarity Be	ofore:	Tex	iture :				· ·	

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INORGANIC ANALYSIS DATA SHEET

•		EPA Sample No.
Lab Name: Spectrum Analytical, Inc. Contract:	Smokey Mountain Smelter 073-0	SMSMW04A
Lab Code : PEL Case No.:	SAS No:	SDG No.: 3506439
Matrix: WATER	Lab Sample ID: 350643906	Natural Assessment
Level:(low/med) LOW	Date Received: 6/29/2012	
PercentSolids: 0	Station ID:	

CONCENTRATION UNITS: MG/L

Comments:

CAS NO.	ANALYTE	Concentration	С	a	M	MDL	RL
47752-0-60-0	Alkalinity (Total)	270			IS	5	10
7664-41-7	Ammonia	37.6			AS	0.02	0.25
7782-41-4	Fluoride	10	U		IC	3.3	10
1-00-5	Nitrate + Nitrite	32.3			AS	0.0022	0.1
14265-44-2	ortho-Phosphate-P	10	UJ	H-1	IC	2.4	10
3-03-5	Sulfate	446			IC	3.2	10

Surrogate	Surrogate Recovery Control Li		Qualifier
Dichloroacetate - DCA	102.6	90 - 115	
•			
Color Before:	Clarity Before:	Texture :	
Color After :	Clarity After:	Artifacts:	 .

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INORGANIC ANALYSIS DATA SHEET

							EPA Sa	mple No.		
Lab Name:	Spectrum Analy	tical, Inc.	Contract:	Smokey Mountain	Smelter 073-0		SMSM	W04ADL1		
Lab Code :	PEL	Case No.:	oranio de la composició d	SAS No:	on aller hanne Kronbern kuntlerense wird er Mittelskin Mitte	SDG No	3506439)	Andrew Market	
Matrix: _v	VATER			Lab Sample ID:	350643906D	L1				
Level:(low/m	ed) LOW	un.	•	Date Received:	6/29/2012				- manufarran	
PercentSolid	s: 0			Station ID:				***************************************		
	•	·								
								4		
CONCENTR	PATION UNITS:	MG/L_					,	4		
CONCENTR CAS NO.	ATION UNITS:	MG/L		Concentration	С		м	d .	MDL	RL

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	93.7	90 - 115	

Color Before:	Clarity Before:	Texture :
Color After:	Clarity After:	Artifacts:
Comments:		

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INORGANIC ANALYSIS DATA SHEET

		EPA Sample No.
Lab Name: Spectrum Analytical, Inc. Cor	ntract: Smokey Mountain Smelte	er 073-0 SMSMW07A
Lab Code : PEL Case No.:	SAS No:	SDG No.: 3506439
Matrix: WATER	Lab Sample ID: 35064	43907
Level:(low/med) LOW	Date Received: 6/29/	/2012
PercentSolids: 0	Station ID:	

CONCENTRATION UNITS: MG/L

Color After:

Comments:

CAS NO.	ANALYTE .	Concentration	С	Q	м		MDL	RL
47752-0-60-0	Alkalinity (Total)	1360	 	· · · · · · · · · · · · · · · · · · ·	IS		5	10
7664-41-7	Ammonia	254			AS		0.02	0.25
7782-41-4	Fluoride	10	U		IC		3.3	10
1-00-5	Nitrate + Nitrite	14.7			AS	<u> </u>	0.0022	0.1
14265-44-2	ortho-Phosphate-P	10	UJ	H-1	IC		2.4	10

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	109.8	90 - 115	
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Color Before:	Clarity Before:	Texture :	<u>. </u>

Clarity After:

Artifacts:

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		11	ORGANIC .	ANALYSIS DATA	SHEET		EDV 6	ample No.		
Lab Name:	Spectrum Analyti	ical Inc	Contract:	Smokey Mountain	Smelter 072 (W07ADL1		
Lab Code :	PEL	Case No.:	. Contract,	SAS No:	Otherel 0/3-0		: 350643			
	-t was definitely and the same	Case No			2506420070		. 330043	13 > Artes (1940) (1940) (1940) (1940) (1940) (1940) (1940) (1940) (1940) (1940) (1940) (1940) (1940) (1940) (1940)	WAZZAR WYSTERN	
~~~	VATER	····*		Lab Sample ID:		L3				
Level:(low/me	proprophilare in the official and a bifurtion's 1970s.			Date Received:	6/29/2012		-1-4-3-4 <b></b>		······································	
PercentSolid	s: <u>0</u>	<del></del>		Station ID:						
CONCENTR	ATION UNITS: 1	/IG/L								
CAS NO.	ANALYTE			Concentration	С	Q	M		MDL	RL
1-00-3	Chloride			23400		·	IC	ļ	170	500
3-03-5	Sulfate			1290	•		IC	-	160	500
			•							
D1 / 1	Surrogate		Recovery		l Limits	Qualifier	$\exists$			÷
Dichloroac	etate - DCA		94.4	90	- 115					
Color Before: _		Clarity Re	fore:	Tex	ture :				•	
Color After:		Clarity At	fter:	Ar	tifacts:	<del></del>				

Comments:

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# INORGANIC ANALYSIS DATA SHEET

							EFA Sample No.	
Lab Name:	Spectrum Analytic	al, Inc.	Contract:	Smokey Mountain	Smelter 073-0	)	SMSMW07B	
Lab Code :	PEL	Case No.:	es habeles mens d'un actual and es	SAS No:	والإنجار الذب تومل المقط والرسيد والمؤسسات والمراجع	SDG No.: 3	3506439	
Matrix: W	ATER			Lab Sample ID:	350643908			
Level:(low/med	d) LOW			Date Received:	6/29/2012	landa da anticipa de la companyo de	of parties I had not be passed to be trained as which the West of the passed on the contract of the contra	
PercentSolids:	: 0	·		Station ID:				

CONCENTRATION UNITS: MG/L

Color After:

Comments:

CAS NO.	ANALYTE	4	Concentration	С	Q	М	MDL	RL
47752-0-60-0	Alkalinity (Total)	<u>:</u>	1060 .			IS	5	10 .
7664-41-7	Ammonia		456			AS	0.02	0.25
7782-41-4	Fluoride		10	U		IC	3.3	10
1-00-5	Nitrate + Nitrite		6.78			AS	 0.0022	0.1
14265-44-2	ortho-Phosphate-P		10	UJ	H-1	IC	2.4	10 :

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	91.0	90 - 115	
Color Before:	Clarity Before:	Texture :	

Clarity After:

Artifacts:_

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# INORGANIC ANALYSIS DATA SHEET

Lab Name:	Spectrum Anal	ytical, Inc.	Contract:	Smokey Mountain	Smelter 073-0			ample No.		-
Lab Code :	PEL	_ Case No.:	North or you night highly has proper their described in SM his SM's	SAS No:		SDG No	o.: 350643	9	T fülgenge kennen	
Matrix: V	VATER ed) LOW			Lab Sample ID: Date Received:	350643908DI 6/29/2012	_1				
PercentSolid	s: 0			Station ID:			de la companya de la		W paragraphy	
				·						
CONCENTR	ATION UNITS:	MG/L		·					·	
CAS NO.	ANALYTE			Concentration	С	Q	M	· ·	MDL	RL
3-03-5	Sulfate			1160			IC		160	500
			·							·

. Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	91.6	90 - 115	

Color Before:	Clarity Before:	Texture :
Color After :	Clarity After:	Artifacts:
Comments:		

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	,	INORGANIC	ANALYSIS DATA	SHEET					
							Sample No.		
Lab Name:	Spectrum Analytical, Inc	c. Contract:	Smokey Mountain	Smelter 073-0		SMSI	MW07BDL2		•
Lab Code:	PEL Case	No.:	SAS No:	oraconomismos are antidos (Medic	SDG No	.: 35064	39	Philippine	
Matrix: V	VATER		Lab Sample ID:	350643908D	L2 ·				
Level:(low/me	ed) LOW		Date Received:	6/29/2012	i de amos so derro al pr <u>a a papare</u> ro s			o Newskair PETE	
PercentSolids	s: <u>0</u>	•	Station ID:		۔ سر رہے صدیسہ ادم ہ				
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									•
CONCENTR	ATION UNITS: MG/L	· · · · · · · · · · · · · · · · · · ·	<u> </u>	<del>-  </del>		· · · · · · · · · · · · · · · · · · ·	<del></del>		1
CAS NO.	ANALYTE		Concentration	C.	Q	М		MDL	RL
1-00-3	Chloride		47300			IC		340	1000
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<del></del> -	Surrogate	Recovery	Combro	1 Limits	Qualifie	- 1			
Dichloroace		97.4		- 115	Quanne				
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Color Before:	Cla	arity Before:	Tex	dure:					
Color After: _	CI	arity After:	Ari	tifacts:					

Comments:

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#### INORGANIC ANALYSIS DATA SHEET

	•						EPA Sample No.
Lab Name:	Spectrum Analytic	cal, Inc.	Contract;	Smokey Mountain	Smelter 073-0		SMSMW08A
Lab Code:	PEL	Case No.:	وريادة والمعاددة والمعاددة والمعاددة	SAS No:	maganyak nghupungkibba m <u>asa asabap</u> aggap	SDG No.:	3506439
Matrix: V	VATER			Lab Sample ID:	350643909	ميدوس متحادث	
Level:(low/me	ed) LOW			Date Received;	6/29/2012	on an annual orange of the same of the sam	كالأسط مو مين علما ألانة فيضي الماسكة و مين من من يها و و المالة فين المؤون و المستعدد المتعدد
PercentSolids	s: 0			Station ID:			

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	С	Q	М		MDL	RL
47752-0-60-0	Alkalinity (Total)	740	<del> </del>		IS		10	20
7664-41-7	Ammonia	66.8			AS		0.02	0.25
7782-41-4	Fluoride	196	J	CLPOa	IC		1.65	5
1-00-5	Nitrate + Nitrite	0.1	U		AS	<del></del>	0.0022	0.1
14265-44-2	ortho-Phosphate-P	5	UJ	H-1	IC		1,2	5
3-03-5	Sulfate	80.5			ic		1.6	5

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	95.2	90 - 115	
Color Before:	Clarity Before:	Texture :	·
Color After:	Clarity After:	Artifacts:	
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Comments:			

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		INORGANIC	ANALYS	IS DATA SHEE	T					
						<u></u>		ample No.		
Lab Name:	Spectrum Ana	lytical, Inc. Contract:	Smokey	Mountain Smel	ter 073-0		SMSM	W08ADL1	-	
Lab Codé :	PEL	Case No.:	SASN	0:		SDG No	.: 350643	9	arm or Assault	
Matrix: W	ATER		Lab Sa	imple ID: 3506	43909D	<u>L1</u>				
Level:(low/med	d) LOW		Date R	eceived: 6/29	9/2012			•		
PercentSolids:	public protected Wilesand and a facilities	<del>ecolit</del> ă	Station		-		1.7 k 1849 (4. c. c. c. 1 - 10 (41) (4 c.		gage-general	
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CONCENTRA	ATION UNITS:	MG/L								
		1	Τ_							
CAS NO.	ANALYTE		Con	centration	С	Q.	М		MDL	RL
-00-3	Chloride		2120				IC		17	50
	¢ .									
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	Surrogate	Recovery	y	Control Limi	ts	Qualifie	-			

Color Before:	Clarity Before:	Texture :
Color After:	Clarity After:	Artifacts:
Comments:		

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Dichloroacetate - DCA

90 - 115

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# INORGANIC ANALYSIS DATA SHEET

•						EF.	A Sample No.	
Lab Name:	Spectrum Analyti	cal, Inc.	_ Contract:	Smokey Mountain	Smelter 073-0		SMSMW10A	
Lab Code :	PEL	Case No.:	·	SAS No		SDG No.: 350	06439	istantes .
Matrix: W	ATER	·		Lab Sample ID:	350643910	Street VI Britan - Chair		
Level:(low/me	d) LOW			Date Received:	6/29/2012			_,
PercentSolids	: <u>0</u>	and the state of t		Station ID:				

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	С	Q	М	MDL	RL
47752-0-60-0	Alkalinity (Total)	1	U		IS	0.5	1
7664-41-7	Ammonia	0.25	U	$\Box$	AS	0.02	0.25
7782-41-4	Fluoride	108	J	CLPOL	. IC	1.65	5
1-00-5	Nitrate + Nitrite	33.2			AS	0.0022	0.1
14265-44-2	ortho-Phosphate-P	5	UJ	4-1	IC	1.2	5

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	104.0	90 - 115	
Color Before:	Clarity Before:	Texture :	
Color After :	Clarity After:	Artifacts:	<del></del>
Comments:			

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#### INORGANIC ANALYSIS DATA SHEET

Lab Name:	Spectrum Analy	tical, Inc.	Contract:	Smokey Mountain	Smelter 073-0		SMSMV	V10ADL1		
Lab Code :	PEL	Case No.:	grangit varia sanas sidan (1840) sandi ir birdə yaçı	SAS No:	nagani da danya (galabanda da manda da papa (gana da maga	SDG No.	3506439	N) - paper and the control on the Control place	-	
Matrix: V	VATER	*************		Lab Sample ID:	350643910DL	.1				
Level:(low/me	ed) LOW			Date Received:	6/29/2012	and only the second		dellara alada masara helikura, veridarki tidab		
PercentSolids	s: 0			Station ID:	-					
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CONCENTR	ATION UNITS:	MG/L						· · · · · · · · · · · · · · · · · · ·		
CACNO	A 1 1 1 1 1 7 7 7 7 7 7 7 7 7 7 7 7 7 7			<u> </u>					·	

EPA Sample No.

CAS NO.	ANALYTE	Concentration	C	Q	M	MDL.	RL
1-00-3	Chloride	1480			IC	 34	100
3-03-5	Sulfate	2680			IC	 32	100

Control Limits

Qualifier

Dichloroacetate - DCA	92.6	90 - 115	
Color Before:	Clarity Before:	Texture :	
Color After :	Clarity After:	Artifacts:	
Comments:			
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Recovery

Surrogate

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# INORGANIC ANALYSIS DATA SHEET

				•			EPA Sample No.	
Lab Name:	Spectrum Analyti	cal, Inc.	Contract:	Smokey Mountain	Smelter 073-0	}	SMSMW10B	
Lab Code :	PEL	Case No.:	nation of the second	SAS No:	and the second state of th	SDG No.:	3506439	-
Matrix: V	/ATER	*****		Lab Sample ID:	350643911	<del></del>	•	
Level:(low/me	d) LOW			Date Received:	6/29/2012			
PercentSolids	s: <u>0</u>			Station ID:	*	· ·		

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	С	Q	М	MDL	RL
47752-0-60-0	Alkalinity (Total)	455	+		IS	5	10
7664-41-7	Ammonia	0.178	J	4-2	AS	 0.02	0.25
1-00-3	Chloride	83			IC	8.5	25
7782-41-4	Fluoride	25	U		IC	 8.25	25
1-00-5	Nitrate + Nitrite	3,76	Ţ.,		AS	 0.0022	0.1
14265-44-2	ortho-Phosphate-P	25	UJ	H-1	IC	 6	25
3-03-5	Sulfate	900			C	8	25

Surrogate	Recovery	Control Limits	Qualitier	
Dichloroacetate - DCA	92.8	90 - 115		
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olor Before:	Clarity Before:	Texture:	<u> </u>	
olor After:	Clarity After:	Artifacts:		

Comments:			

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# INORGANIC ANALYSIS DATA SHEET

						EPA Sample No.
Lab Name:	Spectrum Analy	rtical, Inc.	Contract: Smokey Mountain Smelter 0		Smelter 073-0	SMSRB062812
Lab Code :	PEL	Case No.:	······································	SAS No:	S	DG No.: 3506439
Matrix: V	VATER			Lab Sample ID:	350643912	Than the phone
Level:(low/m	ed) LOW			Date Received:	6/29/2012	
PercentSolid	s: 0	an mar moral a		Station ID:	e and the second of the second	

CONCENTRATION UNITS: MG/L

Surrogate

CAS NO.	ANALYTE	Concentration	С	Q	М	MDL	RL
47752-0-60-0	Alkalinity (Total)	1	T U		is	0.5	1
7664-41-7	Ammonia	0.0477	J		AS	0.02	0.25
1-00-3	Chloride	0.93	J	4-2	IC	0.34	1
7782-41-4	Fluoride	1	U		IC	0.33	1
1-00-5	Nitrate + Nitrite	-0.0058-O./	UJ		AS	0.0022	0.1
14265-44-2	ortho-Phosphate-P	1	UJ	H-1	·IC	0.24	1
3-03-5	Sulfate	0.53	<del></del>	0-2	IC	0.32	1

Control Limits

Dichloroacetate - DCA		100.0	90 - 115	
	,			
Color Before:	Clarity 6	Before:	Texture :	<del></del>
Color After :	Clarity	After:	Artifacts:	
Comments:				
			<del></del> ,	

Recovery

Qualifier

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# INORGANIC ANALYSIS DATA SHEET

					EPA Sample No.	
Lab Name: Spectrum	Analytical, Inc.	_ Contract:	Smokey Mtn Sme	elter 073-01-019	SMSMW13A	
Lab Code: PEL	Case No.:		SAS No:	Sr	OG No.: 3509413	
Matrix: WATER			Lab Sample ID:	350941301	·	
Level:(low/med) LOW	<u>.</u>		Date Received:	6/6/2013		
PercentSolids: 0			Station ID:	w.,,,,.,.,.,.,,,,,,,,,,,,,,,,		
					*	

CONCENTRATION UNITS: MG/L

Comments:

CAS NO.	ANALYTE	Concentration	ပ	Q	М	MDL	RL
47752-0-60-0	Alkalinity (Total)	7			IS	 0.5	1
7664-41-7	Ammonia	0.568			AS	0.02	0.25
1-00-3	Chloride	385			IC	3.4	10
1-01-0	Residue, Filterable (TDS)	. 1060			GR	10	10

Surrogate	Recovery	Control Limits	Qualifier	
Dichloroacetate - DCA	97.6	90 - 115		
Color Before:	Clarity Before:	Texture :	<u>_</u>	
Color After:	Clarity After:	Artifacts:		

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# INORGANIC ANALYSIS DATA SHEET

					*	EPA Sample No.	
Lab Name:	Spectrum Analyti	cal, Inc.	Contract:	Smokey Mtn Sme	lter 073-01-019	SMSMW13B	
Lab Code :	PEL	Case No.:		SAS No:		6DG No.: 3509413	_
Matrix: V	/ATER	<b></b>		Lab Sample ID:	350941302		
Level:(low/me	ed) LOW		1	Date Received:	6/6/2013		_
PercentSolid	s: <u>0</u>	-		Station ID:			

CONCENTRATION UNITS: MG/L

CAS NO. ANALYTE  47752-0-60-0 Alkalinity (Total)		Concentration	С	Q	М		MDL	RL	
		252	<del> </del>	IS			0.5	1 .	
7664-41-7	Ammonia	0.439			AS		0.02	0.25	
1-00-3	Chloride	27.9	†"—		IC		0.34	1	
1-01-0	Residue, Filterable (TDS)	530			GR		10	10	

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	102.0	90 - 115	
Color Before:	Clarity Before:	Texture :	<del></del>
Color After :	Clarity After:	Artifacts:	<u> </u>
Comments:			



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# INORGANIC ANALYSIS DATA SHEET

						EPA Sampl	e No.
Lab Name;	Spectrum Analytic	cal, Inc.	Contract:	Smokey Mtn Sme	lter 073-01-019	SMSMW	12A
Lab Code :	PEL	Case No.:		SAS No:		SDG No.: 3509413	
Matrix:	WATER	other later.		Lab Sample ID:	350941303		
Level:(low/m	ed) LOW			Date Received:	6/6/2013		·····
PercentSolid	ls: <u>0</u>			Station ID:			·

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	С	Q	М	·	MDL	RL
47752-0-60-0	Alkalinity (Total)	343	<del> </del>		IS		0.5	1
7664-41-7	Ammonia	0.612		-	AS		0.02	0.25
1-00-3	Chloride	350			iC .		3.4	10
1-01-0	Residue, Filterable (TDS)	1390	1 -		GR /		10	10

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	97.6	90 - 115	
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Color Before:	Clarity Before:	Texture :
Color After :	Clarity After:	Artifacts:
Comments:		

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# INORGANIC ANALYSIS DATA SHEET

			LEA Sample No.
Lab Name: Spectrum	Analytical, Inc. Contrac	t: Smokey Mtn Smelter 07	73-01-019 SMSMW10A
Lab Code : PEL	Case No.:	SAS No:	SDG No.: 3509413
Matrix: WATER	Party depth of the State of the	Lab Sample ID: 350	941304
Level:(low/med) LOW	<del></del>	Date Received: 6/6	/2013
PercentSolids: 0	***************************************	Station ID:	

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	С	Q	М		MDL	RL
47752-0-60-0	Alkalinity (Total)	1	U		IS	ļ ——	0.5	1
7664-41-7	Ammonia	0.441			AS		0.02	0.25
1-00-3	Chloride	1060	1		IC		17	50
1-01-0	Residue, Filterable (TDS)	4380	1		GR		10	10

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	97.6	90 - 115	l

Color Before:	Clarity Before:	Texture :
Color After:	Clarity After:	Artifacts:
Comments:		

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# INORGANIC ANALYSIS DATA SHEET

						EFA Sain	JIE NO.
Lab Name:	Spectrum Analytical, Inc.	Contract:	Smokey Mtn Sme	lter <u>073-01-</u> 019	9	SMSMV	V11A
Lab Code :	PEL Case No.		SAS No:		SDG No.:	3509413	
Matrix: <u>V</u>	/ATER .		Lab Sample ID:	350941305			
Level:(low/me	ed) LOW		Date Received:	6/6/2013			
PercentSolids	s: <u>0</u>		Station ID:				

CAS NO.	ANALYTE	Concentration	, с	Q	М		MDL	RL
47752-0-60-0	Alkalinity (Total)	1400	<del> </del>		IS		2.5	5
7664-41-7	Ammonia	106			AS		0.02	0.25
1-00-3	Chloride	4370			IC	-	34	100
1-01-0	Residue, Filterable (TDS)	7940			GR		10	10

Surrogate	Recovery	Control Limits	Qualifier	
Dichloroacetate - DCA	97.6	90 - 115		
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Color Before:	Clarity Before:	Texture :	<del></del>	
Color After:	Clarity After:	Artifacts:	<del></del> .	
comments:				

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# INORGANIC ANALYSIS DATA SHEET

			-			EFA Sample NO	·
Lab Name:	Spectrum Analytical, Inc.	Contract:	Smokey Mtn Sme	elter 073-01-019	<u> </u>	SMSMW12B	
Lab Code :	PEL Case No.:		SAS No:		SDG No.:	3509413	
Matrix: V	/ATER	٠	Lab Sample ID:	350941306			
Level:(low/me	ed) LOW		Date Received:	6/6/2013	·		
PercentSolids	s: <u>0</u>		Station ID:			***************************************	

CONCENTRATION UNITS: MG/L

Surrogate

CAS NO.	ANALYTE	Concentration	С	Q	.М		MDL.	RL
47752-0-60-0	Alkalinity (Total)	288	1		IS		1	2
7664-41-7	Ammonia	0.997	1		AS	-	0.02	0.25
1-00-3	Chloride	434			IC		3.4	10 -
1-01-0	Residue, Filterable (TDS)	1690	T		GR		10	10

Dichloroacetate - DCA	97.6	90 - 115	
Color Before:	Clarity Before:	Texture :	
Color After :	Clarity After:	Artifacts:	
Comments:		·	

Recovery

**Control Limits** 

Qualifier

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Lab Name:	Spectrum Analytical, Inc.	_ Contract:	Smokey Mtn Smeiter 073-0	01-019		SMSMW1	1B .
Lab Code :	PEL Case No.:		SAS No:		SDG No.:	3509413	•
Matrix: W	ATER ,		Lab Sample ID: 350941	307	····		
Level:(low/me	d) LOW		Date Received: 6/6/20	13			
PercentSolids	s: <u>0</u>		Station ID:				

CAS NO.	ANALYTE	Concentration	С	Q	M	MDL	RL
47752-0-60-0	Alkalinity (Total)	1320		<u> </u>	IS	 2.5	5
7664-41-7	Ammonia	139			AS	0.02	0.25
1-00-3	Chloride	6310			IC	 34	100
1-01-0	Residue, Filterable (TDS)	10700	_		GR	10	10

Surrogat	e Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	98.0	90 - 115	
,			
Color-Before:	Clarity Before:	Texture :	<u> </u>
Color After :	Clarity After:	Artifacts:	
Comments:			. '
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# INORGANIC ANALYSIS DATA SHEET

	•	EPA Sample No.	
Lab Name: Spectrum Analytical, Inc. Contract:	Smokey Mtn Smelter 073-01-019	SMSMW911B	
Lab Code : PEL Case No.:	SAS No:	SDG No.: 3509413	
Matrix: WATER	Lab Sample ID: <u>350941308</u>	·	
Level:(low/med) LOW	Date Received: 6/6/2013		
PercentSolids: 0	Station ID:		
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CAS NO.	ANALYTE	Concentration	С	. Q	M		MDL	RL
47752-0-60-0	Alkalinity (Total)	1430	ļ		IS	<del> </del>	2.5	5
7664-41-7	Ammonia	139			AS		0.02	0.25
1-00-3	Chloride	6270			IC		34	100
1-01-0	Residue, Filterable (TDS)	. 10800			GR		10	10

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	98.4	90 - 115	
olor Before:	Clarity Before:	Texture :	-
olor After:	Clarity After:	Artifacts:	<del></del> -
omments:		· · · · · · · · · · · · · · · · · · ·	

### April 14, 2014

Ms. Denise Goddard United States Environmental Protection Agency Science and Ecosystem Support Division 980 College Station Road Athens, GA 30605-2720

Subject: Data Review and Validation

Site Name: Smokey Mountain Smelters, Knoxville, TN

Project No.: 14-0032

ELEMENT Sample ID. Nos: NA

Inorganic Analysis: Spectrum Analytical, Tampa, FL

Date(s) Sampled: 11/12 - 14/13

VTSR Date: 11/15/13

Date Received from Lab: 03/18/14

TDF No.: 14T0384

#### Dear Ms. Goddard:

The ESAT Work Team has reviewed the above-captioned data package consisting of adequate deliverables to document EPA Methods SW9060 for TOC; E310.1 for alkalinity; E350.1 for ammonia; E376.1 for sulfide; E300.1 for nitrate, nitrite, ortho-phosphate, fluoride, chloride, and sulfate; and E160.1 for total dissolved solids (TDS) for twenty-four water samples according to EPA guidelines. This package presents acceptable technical performance and generally met the standard for quality required by Region 4 except as detailed below.

Examination of laboratory blank samples revealed apparent low-level contamination with several analytes. Reported detection limits were adjusted as high as ten times the blank levels to discount possible false positives due to contamination in the laboratory and method blanks.

Holding times were missed for nitrate in SDGs 3511012, 3510993, and 3510976 due to the required dilutions. The samples were originally run within holding times but the dilutions were not.

Holding times were missed for all of the anions for five of the six samples in SDG 3511009. The laboratory received the samples within a few hours of holding times expiring. The FedEx shipping label indicates priority overnight delivery requested and it is not clear why the laboratory did not receive the samples until the second day.

Chemical oxygen demand was originally requested but later cancelled by the samplers.

The package appeared complete with the exception of sample raw data for TOC analyses in SDG 3510976.

A Stage 4 validation consisting of manual review was performed on the inorganic samples submitted for this case.

Further details are provided in the attached review summary form. Please feel free to contact this office if we can be of further service.

Very truly yours,

Jue Jones

Sue Jones Chemist

Alion Science and Technology

ESAT Contractor, Region 4 EPA

### Inorganic Data Quality Assessment Record (DQAR)

Review Date:	4/9/14	Analyses:	TOC, NO3, NO2, PO4, SO4, F, Cl, NH3, Sulfide, Alk., TDS	Matrix:	Water	Project #:	14-0032
SDG /L	ab File:		3511012, 3510993,	3510976, 35	511009	1007 B	N 522
Labo	ratory		9	Spectrum A	nalytical, Tampa, FI	•	200 DE 201 DE 201
Site I	Vame:	Smok	ey Mountai	n Smelters, Knoxvill	e, TN		
Checl	к Опе:	EPA	ESAT (	CLP	Other (specify)	Non-CLP	(RAS)

Signatures: SJ

Reviewer

Review Codes: M- Metals, H- Mercury, C- Cyanide, O- Others

Sample Numbers:						
Water:	T T	Soil/Sediment:				
SMSMW12A	SMSSW04					
SMSMW01A	SMSSW08					
SMSMW03B	SMSSW08SPRING					
SMSMW04A	SMSSW09					
SMSSW03	SMSSW09SPRING					
SMSSW13	SMSSW20					
SMSMW10B	SMSMW02A		1000			
SMSMWIIA	SMSMW07A					
SMSMW11B	SMSMW07B					
SMSMW12B	SMSMW08A					
SMSMW13B	SMSSW11					
SMSSW01	SMSSW14					

### I. SUMMARY OF PROBLEMS AND COMMENTS:

A summary of deficiencies noted for the methods used to generate data for this project is presented below. Please refer to the Data Quality Assessment Record (DQAR) for each data file and the data flag summary table at the end of this review document. For the purposes of this review, the QC limits specified in the analytical method have been applied to the data. Data qualifier recommendations are made in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (Functional Guidelines), and the Region 4 SOP, Data Validation Standard Operating Procedures for Contract Laboratory Program Routine Analytical Services (R4DVSOP).

**Data Review Comments:** 

	II. Data Quality Assessment (An explanation for any "no" answer must be provided)			
1.	Summary	Yes	N/A	No
	Were all requested analyses performed?	0		
	Were all required QC checks performed?	0		
	Were all required documents present?	O		0
3	Were requested detection limits met?	?		

Remark: Project required detection limits are unknown. COD was originally scheduled but cancelled. In SDG 3510976, the raw TOC data provided did not include data for the sample runs in that SDG and so reported TOC results could not be verified against raw data.

2.	Holding Times:(Holding times are not applicable for non-aqueous samples)	Yes	N/A	No
30	Were water samples properly preserved?	0		
N N	Were water holding time requirements met?	0		0

3. Calibrations:  A. Initial Calibration:  Were acceptable correlation coefficients obtained?  Were acceptable & Recoveries for analytes obtained?  B. Continuing Calibration  Were acceptable & Recoveries for analytes obtained?  B. Continuing Calibration  Were acceptable & Recoveries for analytes obtained?  Remark: Evaluation was performed according to the laboratory calibration limits for these non-CLP analytes which are outside of the *- 10% customarily used for metals evaluation.  4. Blanks:  Yes N/A No  Were any contaminants noted in the blanks?  O O O  If yes, were blank rules applied to the data?  Remark: 10X rule applied  5. ICP Interference Check Sample:  Were False positives Reported?  Were False negatives reported?  Were False negatives reported?  Were samples spikide at appropriate levels?  Were samples spiked at appropriate levels?  Were amarix spike/matrix spike duplicate analyses performed?  Were acceptable recoveries obtained?  Was a matrix spike recoveries obtained?  Was a matrix duplicate analysis performed?  Was a p.E.S. analyzed with the samples?  Was analyzed with the samples?  Was a p.E.S. analyzed with the samples?  Remark: LCS/LCSD recoveries and RPDs were used for accuracy and precision information.  8. Performance Evaluation Sample (PES):  Yes N/A No  Was a p.E.S. analyzed with the samples?  Remark:  9. Method Standard / Laboratory Control Sample:  Yes N/A No  Were acceptable receision obtained?  Remark:	100	Remark: Holding times for nitrate were missed in SDGs 3511012, 3510993, and 3510976 missed in SDG 3511009. Samples were "J" qualified.	. Holding tim	es for anions	were
A. Initial Calibration:  Were acceptable overlation coefficients obtained?  Were acceptable % Recoveries for analytes obtained?  B. Continuing Calibration  Were acceptable % Recoveries for analytes obtained?  B. Continuing Calibration  Were acceptable % Recoveries for analytes obtained?  Remark: Evaluation was performed according to the laboratory calibration limits for these non-CLP analytes which are outside of the +- 10% customarily used for metals evaluation.  4. Blanks:  Yes N/A No  Were any contaminants noted in the blanks?  O O O  If yes, were blank rules applied to the data?  Remark: 10X rule applied  5. ICP Interference Check Sample:  Yes N/A No  Were rasults within 20% of the true value?  Were False negatives Reported?  Were False negatives Reported?  O Were Remark:  6. Matrix spikes:  Yes N/A No  Was a matrix spike analysis performed?  Were samples spiked at appropriate levels?  Were matrix spike dupticate analyses performed?  Were acceptable recoveries obtained?  Was acceptable precision obtained?  Remark:  7. Matrix duplicate analysis:  Yes N/A No  Was a matrix duplicate analysis performed?  Was a matrix duplicate analysis:  Yes N/A No  Was a please precision obtained?  Was a please precision obtained?  Was a please precision obtained?  Was a please precision information.  8. Performance Evaluation Sample (PES):  Yes N/A No  Were acceptable recoveries obtained?  Remark:  9. Method Standard / Laboratory Control Sample:  Yes N/A No  Were acceptable precision obtained?  Were acceptable precisio					
Were acceptable correlation coefficients obtained?  Were acceptable ½ Recoveries for analytes obtained?  B. Continuing Calibration  Were acceptable ½ Recoveries for analytes obtained?  Remark: Evaluation was performed according to the laboratory calibration limits for these non-CLP analytes which are outside of the +- 10½ customarily used for metals evaluation.  4. Blanks:  Vers N/A No Were any contaminants noted in the blanks?  O O O If yes, were blank rules applied to the data?  Remark: 10X rule applied  5. ICP Interference Check Sample:  Vere results within 20% of the true value?  Were results within 20% of the true value?  Were False negatives reported?  Were False negatives reported?  Were False negatives reported?  Were samples spikted analysis performed?  Were matrix spike analysis performed?  Were acceptable recoveries obtained?  Was a matrix spike/matrix spike duplicate analyses performed?  Was a acceptable precision obtained?  Was a matrix duplicate analysis:  Remark: There were no samples identified for MS/MSD analysis. LCS/LCSD recoveries and RPDs were used for accuracy and precision information.  8. Performance Evaluation Sample (PES):  Was a P.E.S. analyzed with the samples?  If yes, were acceptable recoveries and RPDs were used for accuracy and precision information.  9. Method Standard / Laboratory Control Sample:  Yes N/A No Was acceptable recoveries obtained?  Remark:  Yes N/A No Was a P.E.S. analyzed with the samples?  If yes, were acceptable results obtained?  Were acceptable recoveries obtained?	3.	Calibrations:	Yes	N/A	No
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Was acceptable precision obtained?	9.	Method Standard / Laboratory Control Sample:	Yes	N/A	No
		Were acceptable recoveries obtained?	0	860	
Remark:		Was acceptable precision obtained?	0		
		Remark:			

10.	ICP Serial Dilution Sample:	Yes	N/A	No
	Was ICP serial dilution analysis performed?			0
	Were diluted results within 10% of undiluted sample result?		0	
	Remark:			
				(1) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A
11.	Completeness:	Yes	N/A	No
11.	Completeness: Were all requested analyses performed?	Yes O	N/A	No
11.		Yes O	N/A	No
11.	Were all requested analyses performed?	0	N/A	No

# **Additional Comments:**

# III. Data Qualifiers Summary

Based on a review of the quality control information, the following is a table summarizing the data qualifiers used by Region 4 for this data review report.

		Recommended	<b>Data Qualifiers</b>				
Case	NA	Project Number:			NT Sample Nos.	NA	
Site	Smoke	y Mountain Smelters, Kn	oxville, TN	cville, TN D		3/24/14	
Affected Samples		Analytes	Recommended	Oualifiers		Reason	
SMSSW03	Ammo		U, B-4		Raised RL due to blar contamination		
SMSSW01	Chloric	le	U, B-4		Raised RL contamina	due to blank tion	
SMSSW01	Sulfate		U, B-4		Raised RL contamina	due to blank tion	
SMSMW12A, SMSMW01A SMSMW04A, SMSMW12B			J, H-6		Holding time missed for dilutions		
SMSMW02A, SMSMW07B SMSMW08A, SMSSW11, S	, Anions MSSW14	via 300.1	J, H-1		Holding time missed		
SMSMW12A, SMSMW13B SMSSW01, SMSSW04, SM SMSSW08SPRING, SMSSV SMSSW09SPRING, SMSSV SMSSW11, SMSSW14	SSW08, V09,	nia	J, Q-2	CI.	Concentrat	tion <rl and="">MDI</rl>	
SMSMW12A, SMSMW01A SMSMW03B, SMSMW11A SMSMW12B, SMSMW13B SMSSW01, SMSSW08SPRI SMSSW09, SMSSW09SPRI SMSSW20, SMSMW02A, SMSMW08A, SMSSW11, S	NG, NG,		J, Q-2		Concentrat	tion <rl and="">MDI</rl>	
SMSMW01A	Ortho-p	ohosphate	J, Q-2		Concentrat	tion <rl and="">MDI</rl>	
SMSSW03	Nitrate	S) 26	J, Q-2		Concentrat	tion <rl and="">MDI</rl>	
	SSW03, SMSMW12B, SMSSW08, SSW08SPRING, SMSSW09, SSW11 J, Q-2				Concentrat	tion <rl and="">MDI</rl>	
SMSSW13, SMSMW13B, S SMSSW09SPRING, SMSSV	V14		J, Q-2		J, Q-2 Concentration <		tion <rl and="">MDI</rl>
SMSMW13B, SMSSW08SP SMSSW09, SMSSW14	RING, Fluorid	e	J, Q-2	- 10 7 G S S	Concentrat	tion <rl and="">MDI</rl>	

May 16, 2014

Ms. Denise Goddard United States Environmental Protection Agency Science and Ecosystem Support Division 980 College Station Road Athens, GA 30605-2720

Subject: Data Review and Validation

Site Name: Smokey Mountain Smelters, Knoxville, TN

Project No.: 14-0032

ELEMENT Sample ID. Nos: NA

Inorganic Analysis: Spectrum Analytical, Tampa, FL

Date(s) Sampled: 11/12 - 14/13

VTSR Date: 11/15/13

Date Received from Lab: 03/18/14

TDF No.: 14T0384

Dear Ms. Goddard:

The ESAT Work Team has reviewed the above-captioned data package consisting of adequate deliverables to document EPA Methods SW9060 for TOC; E310.1 for alkalinity; E350.1 for ammonia; E376.1 for sulfide; E300.1 for nitrate, nitrite, ortho-phosphate, fluoride, chloride, and sulfate; and E160.1 for total dissolved solids (TDS) for twenty-four water samples according to EPA guidelines. This package presents acceptable technical performance and generally met the standard for quality required by Region 4 except as detailed below.

Examination of laboratory blank samples revealed apparent low-level contamination with several analytes. Reported detection limits were adjusted as high as ten times the blank levels to discount possible false positives due to contamination in the laboratory and method blanks.

Holding times were missed for nitrate in SDGs 3511012, 3510993, and 3510976 due to the required dilutions. The samples were originally run within holding times but the dilutions were not.

Holding times were missed for all of the anions for five of the six samples in SDG 3511009. The laboratory received the samples within a few hours of holding times expiring. The FedEx shipping label indicates priority overnight delivery requested and it is not clear why the laboratory did not receive the samples until the second day.

Chemical oxygen demand was originally requested but later cancelled by the samplers,

A Stage 4 validation consisting of manual review was performed on the inorganic samples submitted for this case.

Further details are provided in the attached review summary form. Please feel free to contact this office if we can be of further service.

Very truly yours,

Sue Jones

Chemist

Alion Science and Technology ESAT Contractor, Region 4 EPA

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### Inorganic Data Quality Assessment Record (DQAR)

Review Date:	4/9/14	Analyses:	TOC, NO3, NO2, PO4, SO4, F, Cl, NH3, Sulfide, Alk., TDS	Matrix:	Water	Project #:	14-0032
SDG/L	ab File:		3511012, 3510993,	3510976, 3	511009		
Laboi	ratory		5	Spectrum A	nalytical, Tampa, FL	,	
Site N	lame:	Smokey Mountain Smelters, Knoxville, TN					
Check	COne:	EPA	ESAT	CLP	Other (specify)	Non-CLP	(RAS)

Signatures: SJ

Reviewer

Review Codes: M- Metals, H- Mercury, C- Cyanide, O- Others

Sample Numbers:							
Water:		Soil/Sediment:					
SMSMW12A	SMSSW04						
SMSMW01A	SMSSW08						
SMSMW03B	SMSSW08SPRING						
SMSMW04A	SMSSW09						
SMSSW03	SMSSW09SPRING	·	****				
SMSSW13	SMSSW20						
SMSMW10B	SMSMW02A						
SMSMW11A	SMSMW07A		· <del></del>				
SMSMW11B	SMSMW07B		<del></del>				
SMSMW12B	SMSMW08A						
SMSMW13B	SMSSW11						
SMSSW01	SMSSW14						

### I. SUMMARY OF PROBLEMS AND COMMENTS:

A summary of deficiencies noted for the methods used to generate data for this project is presented below. Please refer to the Data Quality Assessment Record (DQAR) for each data file and the data flag summary table at the end of this review document. For the purposes of this review, the QC limits specified in the analytical method have been applied to the data. Data qualifier recommendations are made in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (Functional Guidelines), and the Region 4 SOP, Data Validation Standard Operating Procedures for Contract Laboratory Program Routine Analytical Services (R4DVSOP).

### **Data Review Comments:**

N/A	No
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N/A	No
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3. Calibrations:  A. Initial Calibration:  Were acceptable correlation coefficients obtained?  Were acceptable % Recoveries for analytes obtained?  B. Continuing Calibration  Were acceptable % Recoveries for analytes obtained?  Remark: Evaluation was performed according to the laboratory calibration limits for these non-CLP analytes which of the +- 10% customarily used for metals evaluation.  4. Blanks:  Yes N/A  Were any contaminants noted in the blanks?  O If yes, were blank rules applied to the data?	
A. Initial Calibration:  Were acceptable correlation coefficients obtained?  Were acceptable % Recoveries for analytes obtained?  B. Continuing Calibration  Were acceptable % Recoveries for analytes obtained?  Were acceptable % Recoveries for analytes obtained?  Remark: Evaluation was performed according to the laboratory calibration limits for these non-CLP analytes which of the +- 10% customarily used for metals evaluation.  4. Blanks:  Yes N/A  Were any contaminants noted in the blanks?  O	No
Were acceptable % Recoveries for analytes obtained?  B. Continuing Calibration  Were acceptable % Recoveries for analytes obtained?  Remark: Evaluation was performed according to the laboratory calibration limits for these non-CLP analytes which of the +- 10% customarily used for metals evaluation.  4. Blanks:  Yes N/A  Were any contaminants noted in the blanks?  O	
Were acceptable % Recoveries for analytes obtained?  B. Continuing Calibration  Were acceptable % Recoveries for analytes obtained?  Remark: Evaluation was performed according to the laboratory calibration limits for these non-CLP analytes which of the +- 10% customarily used for metals evaluation.  4. Blanks:  Yes N/A  Were any contaminants noted in the blanks?  O	
B. Continuing Calibration  Were acceptable % Recoveries for analytes obtained?  Remark: Evaluation was performed according to the laboratory calibration limits for these non-CLP analytes which of the +- 10% customarily used for metals evaluation.  4. Blanks:  Yes N/A  Were any contaminants noted in the blanks?  O	<del> </del>
Were acceptable % Recoveries for analytes obtained?  Remark: Evaluation was performed according to the laboratory calibration limits for these non-CLP analytes which of the +- 10% customarily used for metals evaluation.  4. Blanks:  Yes N/A  Were any contaminants noted in the blanks?  O	
Remark: Evaluation was performed according to the laboratory calibration limits for these non-CLP analytes which of the +- 10% customarily used for metals evaluation.  4. Blanks:  Were any contaminants noted in the blanks?  Yes N/A  O	
Were any contaminants noted in the blanks?	are outside
Were any contaminants noted in the blanks?	No
	0
	<del>                                     </del>
Remark: 10X rule applied	<u></u>
Technical 1911 for applica	
5. ICP Interference Check Sample:  Yes N/A	No
Were results within 20% of the true value?	
Were False positives Reported?	
Were False negatives reported?	
Remark:	<u></u>
6. Matrix spikes: Yes N/A	No
Was a matrix spike analysis performed?	0
Were samples spiked at appropriate levels?	0
Were matrix spike/matrix spike duplicate analyses performed?	0
Were acceptable recoveries obtained?	0
Was acceptable precision obtained?	0
Remark: There were no samples identified for MS/MSD analysis. LCS/LCSD recoveries and RPDs were used for a precision information.	ccuracy and
7. Matrix duplicate analysis:  Yes N/A	No
Was a matrix duplicate analysis performed?	0
Was duplicate precision in control?	<u> </u>
Remark: LCS/LCSD recoveries and RPDs were used for accuracy and precision information.	<u> </u>
8. Performance Evaluation Sample (PES):  Yes N/A	No
Was a P.E.S. analyzed with the samples?	0
If yes, were acceptable results obtained?	
Remark:	
0 26-4-16-4-17-1-17-1-17-1-17-1-17-1-17-1-1	N _a
9. Method Standard / Laboratory Control Sample: Yes N/A	No
Were acceptable recoveries obtained?  O	
Was acceptable precision obtained?	
Remark:	

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0.	ICP Serial Dilution Sample:	<del>_</del>	Yes	N/A	No
	Was ICP serial dilution analysis performed?				0
	Were diluted results within 10% of undiluted sample result?		<del> </del>	0	
	Remark:				
			·	<u>'                                    </u>	
11.	Completeness:		Yes	N/A	No
	Were all requested analyses performed?		0		
	Were all required documents present? If yes, were results provided?		0		
	Were results of calculation checks acceptable?		0		
	Remark:				

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# **Additional Comments:**

# III. Data Qualifiers Summary

Based on a review of the quality control information, the following is a table summarizing the data qualifiers used by Region 4 for this data review report.

			Recommended	Data Qualifier	S		
Case	NA		Project Number:	14-0032		NT Sample Nos.	NA
Site	Sn	nokey M	ountain Smelters, Kno	oxville, TN	D	ate:	3/24/14
						<u></u>	
Affected Samples			Analytes	Recommended	Qualifiers		Reason
SMSSW03		mmonia	·····	U, B-4		contaminat	
SMSSW01	Cl	hloride		U, B-4		Raised RL contaminat	due to blank ion
SMSSW01	Su	ılfate		U, B-4		Raised RL contaminat	due to blank ion
SMSMW12A, SMSMW01A SMSMW04A, SMSMW12B		itrate		J, H-6		Holding tir	ne missed for
SMSMW02A, SMSMW07B, SMSMW08A, SMSSW11, S	MSSW14	nions via	300.1	J, H-1		Holding tir	
SMSMW12A, SMSMW13B, SMSSW01, SMSSW04, SMS SMSSW08SPRING, SMSSW SMSSW09SPRING, SMSSW SMSSW11, SMSSW14	SSW08, V09,	mmonia		J, Q-2		Concentrat	ion <rl and="">MDL</rl>
SMSMW12A, SMSMW01A, SMSMW03B, SMSMW11A, SMSMW12B, SMSMW13B, SMSSW01, SMSSW08SPRI SMSSW09, SMSSW09SPRI SMSSW20, SMSMW02A, SMSMW08A, SMSSW11, SI	NG, NG, MSSW14	ılfide		J, Q-2			ion <rl and="">MDL</rl>
SMSMW01A		tho-phos	phate	J, Q-2			ion <rl and="">MDL</rl>
SMSSW03		trate		J, Q-2			ion <rl and="">MDL</rl>
SMSSW03, SMSMW12B, SI SMSSW08SPRING, SMSSW SMSSW11	709,	trite		J, Q-2			ion <rl and="">MDL</rl>
SMSSW13, SMSMW13B, SM SMSSW09SPRING, SMSSW	/14			J, Q-2			ion <rl and="">MDL</rl>
SMSMW13B, SMSSW08SP1 SMSSW09, SMSSW14	RING, Flu	uoride		J, Q-2		Concentrat	ion <rl and="">MDL</rl>

# INORGANIC ANALYSIS DATA SHEET

						·	Er A Jairiple	10.
Lab Name:	Spectrum Analy	tical, Inc.	_ Contract:	.Smokey Mountain	Smelters 073-	<u> </u>	SMSMW12	2A
Lab Code:	PEL	Case No.:		SAS No:		SDG No.:	3511012	
Matrix: V	VATER	<del></del>		Lab Sample ID:	351101201			
Level:(low/me	ed) LOW	_		Date Received:	11/15/2013	<del></del>		•
PercentSolid	s: <u>0</u>	······································		Station ID:	·			· · · · · · ·

CAS NO.	ANALYTE	•	Concentration	С	' Q	м	ME	DL RL
47752-0-60-0	Alkalinity (Total)	<del> </del>	230	_	· .	1S	5	10
7664-41-7	Ammonia		0.0557	J	4-2	AS	0.02	0.25
7782-41-4	Fluoride		1	U		IC .	0.33	1
25-90-0	Nitrate-N		~- 20.8	E-		C	0.036	0.1
15-90-0	Nitrite-N		0.1	U		C	0.031	0.1
14265-44-2	ortho-Phosphate-P		1	U		C	0.24	1
1-01-0	Residue, Filterable (TDS)		1460			GR	10	10
18496-25-8	Sulfide		0.2	J	Q-2	T	0.08	2
1012_5	TOC		2.11		7	TC	0.31	1

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	104.0	90 - 115	

Color Before:	Clarity Before:	Texture :	_
Color After :	Clarity After.	Artifacts:	
Comments:			
	<u> </u>		

INORGANIC ANALYSIS DATA SHEET

		EPA Sample	a No.
Lab Name: Spectrum Analytical, Inc. C	Contract:	Smokey Mountain Smelters 073- SMSMW12	ADL1
Lab Code : PEL Case No.:		SAS No: SDG No.: 3511012	and the major of the first and the second se
Matrix: WATER		Lab Sample ID: 351101201DL1	
Level:(low/med) LOW		Date Received: 11/15/2013	m yang may may gap a yay didankahan m
PercentSolids: 0		Station ID:	

CAS NO.	ANALYTE		Concentration	С	Q .	М	MDL	RL
1-00-3	Chloride	N. Company	338			IC	3.4	.10
25-90-0	Nitrate-N		21.4	J,	H-6	IC	0.36	1
3-03-5	Sulfate	· · · · · · · · · · · · · · · · · · ·	220			IC	3.2	10

Surrogate		Recovery	Control Limits	Qualifier	
Dichloroacetate - DCA		91.6	90 - 115		
•					
Color Before:	Clarity Be	efore:	Texture :	<del></del>	
Color After:	Clarity After:		Artifacts:		
Comments:					

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### INORGANIC ANALYSIS DATA SHEET

· · · · · · · · · · · · · · · · · · ·		EFA Sample No.
Lab Name: Spectrum Analytical, Inc. Contract:	Smokey Mountain Smelters 073-	SMSMW01A
Lab Code : PEL Case No.:	SAS No:	SDG No.: 3511012
Matrix: WATER	Lab Sample iD: 351101202	
Level:(low/med) LOW	Date Received: 11/15/2013	
PercentSolids: 0	Station ID:	

CAS NO.	ANALYTE	Concentration	С	Q	М		MDL	RL
47752-0-60-0	Alkalinity (Total)	635			IS		2.5	5
7664-41-7	Ammonia	263			AS		0.02	0.25
25-90-0	Nitrate-N	93.1	E		IC		0.036	0.1
15-90-0	Nitrite-N	0.21			IC		0.031	0.1
14265-44-2	ortho-Phosphate-P	0.92	J	0-2	IC	•	0.24	1
1-01-0	Residue, Filterable (TDS)	32100	1		GR		10	10
18496-25-8	Sulfide	0.1	J	0-2	T		0.08	2
1012_5	TOC	9.5			TC		0.31	1

Surrogate	Recovery	Control Limits	Qualifier
Dichtoroacetate - DCA	98.0	90 - 115	
		*	

Color Before:	Clarity Before:	Texture :	
Color After:	Clarity After:	Artifacts:	: .
Comments:			

### INORGANIC ANALYSIS DATA SHEET

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CAS NO.	ANALYTE.	Concentration	С	Q	М		MDL	RL
7782-41-4	Fluoride	25	U	2	IC		8:25	25
25-90-0	NitrateN	97.5			IC	-	0.9	2.5
3-03-5	Sulfate	900 .			IC		8	25

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	100.0	90 - 115	

Color Before:	Clarity Before:	Texture :
Color After :	Clarity After:	Artifacts:
Comments:		

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# INORGANIC ANALYSIS DATA SHEET

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1-00-3

25-90-0

Chloride

Nitrate-N

Lab Name:	Spectrum Analyt	ical, Inc.	_ Contract:	Smokey Mountain	Smelters 07	3	SMSN	IW01ADL2	<u> </u>	
Lab Code :	PEL	Case No.:		SAS No:		SDG N	o.: <u>351101</u>	2		
Matrix: W	ATER	Loronian	• .	Lab Sample ID:	351101202	DL2				
Level:(low/med	d) LOW	•		Date Received:	11/15/201	3		· · · · · · · · · · · · · · · · · · ·	· .	
PercentSolids:	: 0			Station ID:					,	
						7				
	1			•						
CONCENTRA	TION UNITS:	MG/L		·						
CAS NO.	ANALYTE			Concentration	С	Q	М		MDL	RL

EPA Sample No.

IC -

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	•		
Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	95.2	90 - 115	

Color Before:	Clarity Before:	Texture:	•
Color After :	Clarity After:	Artifacts:	
Comments:			

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# INORGANIC ANALYSIS DATA SHEET

	•			•			EPA Samp	ie iyo.	
Lab Name: Spectrum Analyti		cal, Inc.	I, Inc. Contract: Smokey Mou		Smelters 073-		SMSMW03B		
Lab Code :	PEL	Case No		SAS No:		SDG No.:	3510993		
Matrix:	WATER	<del></del>		Lab Sample ID:	351099301				
Level:(low/r	ned) LOW			Date Received:	11/14/2013				
PercentSol	ids: <u>0</u>	·		Station ID:		یت نظایت ری در داشت ساخت		,	_

CAS NO.	ANALYTE	Concentration	С	Q	М	MDL	RL A
47752-0-60-0	Alkalinity (Total)	456	<del>                                     </del>		IS	 1	2
7664-41-7	Ammonia	 107	1		AS	0.02	0.25
7782-41-4	Fluoride	1	U		2	0.33	1
25-90-0	Nitrate-N	0.1	U		IC	0.036	0.1
15-90-0	Nitrite-N	0.1	U		iC	0.031	0.1
14265-44-2	ortho-Phosphate-P	1	U		IC	0.24	1
1-01-0	Residue, Filterable (TDS)	96700			GR	10	10
18496-25-8	Sulfide	1	J	4-2	T	0.08	.2
1012_5	TOC	19.3			TC	0.31	1

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	92.0	90 - 115	

Color Before:	Clarity Before:	Texture :
Color After :	Clarity After:	Artifacts:
Comments:		

# INORGANIC ANALYSIS DATA SHEET

Lab Name:	Spectrum Analytical, Inc.	lytical, Inc. Contract: Smokey Mountain Smelters 073-			SMSMW03BDL1				
Lab Code :	PEL Case No.:	JAI Pro-to-Water II montained a	SAS No:	S Straight Court (122 hage 1518 Block Laws Austin	SDG №	.: 351099	3	·	
Matrix: V	VATER		Lab Sample ID:	351099301D	L1		,		
Level;(low/me	ed) LOW		Date Received:	11/14/2013			encolorist at a stort or and little colorise		
PercentSolid	s: 0		Station ID:				· · · · · · · · · · · · · · · · · · ·	under with the	
				<i>:</i>					
CONCENTR	ATION UNITS: MG/L			· · · · · · · · · · · · · · · · · · ·					
CAS NO.	ANALYTE	-	Concentration:	С	Q	М		MDL	RL

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EPA Sample No.

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	Surrogate	Recovery	Control Limits	Qualifier
Di	chloroacetate - DCA	94.8	90 - 115	

Color Before:	Clarity Before:	Texture:
Color After :	Clarity After:	Artifacts:
Comments:		. <del>.</del>

3-03-5

Sulfate

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# INORGANIC ANALYSIS DATA SHEET

							EPA 3	impie ivo.		
Lab Name: Spectrum Analytical, Inc.		Contract: Smokey Mountain Smelters 073-			SMSM					
Lab Code:	PEL	Case No.:		SAS No:		SDG No.:	351099	3	overnika.	
Matrix: W	/ATER	·····		Lab Sample ID:	351099301D	L2			· .	•
Level:(low/me	d) LOW			Date Received:	11/14/2013	· · · · · · · · · · · · · · · · · · ·			<u></u>	
PercentSolids	s: 0 ·			Station ID:			· · · · · · · · · · · · · · · · · · ·		numbers	
	,									•
CONCENTRA	ATION UNITS:	MG/L								
CAS NO.	ANALYTE			Concentration	С	Q	М	:	MDL	RL
-00-3	Chloride	· ·		52100	<del>-   , -</del>		IC .		340	1000

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	90.2	90 - 115	

Color Before:	Clarity Before:	Texture:
Color After:	Clarity After:	Artifacts:
Comments:		
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# INORGANIC ANALYSIS DATA SHEET

		•	•		•		EPA Sample No.	
Lab Name: Spectrum Analytical, Inc.		Contract:	Smokey Mountain	Smelters 073-		SMSMW04A		
Lab Code :	PEL	Case No.:	درده در میاند. ماهای در میانده این	SAS No:	Plant Normalistic constraints of the Park Normalist Conference of	SDG No.:	3510993	
Matrix: W/	ATER	aut.		Lab Sample ID:	351099302	· · ·		
Level:(low/med	l) LOW			Date Received:	11/14/2013			_
PercentSolids:	0			Station ID:	,			•••

CAS NO.	ANALYTE	Concentration	С	Q	М		MDL	RL
47752-0-60-0	Alkalinity (Total)	140	+ +		IS		2.5	5
7664-41-7	Ammonia	57.3			AS	·	0.02	0.25
7782-41-4	Fluoride	3.3			IC		0.33	1
25-90-0	Nitrate-N	29.4	<del> </del> -	-	IC		0.036	0.1
15-90-0	Nitrite-N	0.1	U		IC		0.031	0.1
14265-44-2	ortho-Phosphate-P	1	U		IC		0.24	1
1-01-0	Residue, Filterable (TDS)	23200			GR	1.	10	10
18496-25-8	Sulfide	2	U		Ţ	<u> </u>	0.08	2
1012_5	тос	4.36			TC		0.31	1

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	98.0	90 - 115	

Color Before:	Clarity Before:	Texture :
Color After:	Clarity After:	Artifacts:
Comments:		

# INORGANIC ANALYSIS DATA SHEET

		•			EPA Sali	ipie ivo.	
Lab Name: Spectrum Analytical, Inc.	Contract:	Smokey Mountain	Smelters 073-		SMSMW	04ADL1	
Lab Code : PEL Case No.:	** ***********	SAS No:		SDG No.:	3510993		
Matrix: WATER		Lab Sample ID:	351099302DL	1	* .		
Level:(low/med) LOW		Date Received:	11/14/2013				_
PercentSolids: 0		Station ID:					

CAS NO.	ANALYTE	Concentration	С	Q	М	MDL	RL
25-90-0	Nitrate-N	 32.4	J.	4-6	IC:	0.36	1
3-03-5	Sulfate	 578			IC	3.2	10

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	92.2	90 - 115	

Color Before:	Clarity Before:	Texture :
Color After:	Clarity After:	Artifacts:
Comments:		

# INORGANIC ANALYSIS DATA SHEET

i i		4 4	Erredample me.	_
Lab Name: Spectrum Analyti	tical, Inc. Contract:	Smokey Mountain Smelters 073-	SMSMW04ADL2	
Lab Code : PEL	Case No.:	SAS No:	SDG No.: 3510993	•
Matrix: WATER	Marine.	Lab Sample ID: 351099302DL	2	
Level:(low/med) LOW		Date Received: 11/14/2013		
PercentSolids: 0	· ·	Station ID:		
OONOENTBATION (AUTO. A	vo.#			

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	92.8	90 - 115	
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Color Before:	Clarity Before:	Texture :
Color After:	Clarity After:	Artifacts:
Comments:		
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# INORGANIC ANALYSIS DATA SHEET.

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Lab Name:	Spectrum Analyti	cal, Inc.	Contract:	Smokey Mountain	Smelters 073-	. [	SMSSW03	
Lab Code :	PEL	Case No.:	·	SAS No:	ir. Bi Formal manusus prompanerys opysius neiso sys p _e	SDG No.:	3510993	
Matrix:	WATER	<del></del>		Lab Sample ID:	351099303	<u> </u>		
Level:(low/m	ed) LOW			Date Received:	11/14/2013			
PercentSolid	is: 0			Station ID:	·			

CAS NO.	ANALYTE	Concentration	C	ا م	М	MDL	RL
G. 10 110.	711.00	Concentration		3	141	""	'"-
47752-0-60-0	Alkalinity (Total)	255			IS	2.5	5
7664-41-7	Ammonia	0.252	u,	B-4	AS	0.02	0.25
7782-41-4	Fluoride	8.4		11	IC	0.33	1
25-90-0	Nitrate-N	0.069	J	0-2	IC.	0.036	0.1
15-90-0	Nitrite-N	0.064	J	Q-2	IC	0.031	0.1
14265-44-2	ortho-Phosphate-P	1	U		IC	0.24	1
1-01-0	Residue, Filterable (TDS)	1110			GR	10	10
3-03-5	Sulfate	9 .			IC .	0.32	1
18496-25-8	Sulfide	2	U		T	0.08	2
1012_5	TOC	20.6			TC	0.31	1

	Surrogate	Recovery	Control Limits	Qualifier
i	Dichloroacetate - DCA	94.0	90 - 115	

Color Before:		Clarity Before:	<u> </u>	Texture :	· ·
Color After: _		Clarity After:		Artifacts:	·
Comments:				,	
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# INORGANIC ANALYSIS DATA SHEET

								allipie 140.		
Lab Name:	Spectrum Anal	ytical, Inc.	Contract:	Smokey Mountain	Smelters 073-		SMS	SW03DL1		
Lab Code :	PEL	Case No.:	and the state of t	SAS No:	энгу бай тарууу улуудан рамана санаат улуу.	SDG N	351099	93	, nico alikieran	
Matrix: V	VATER	· ·		Lab Sample ID:	351099303DI	1				
Level:(low/m	ed) LOW			Date Received:	11/14/2013			gg	ì	
PercentSolid	s: 0	**************************************		Station ID:	·			and a second have been an about the second		
							•		•	
CONCENTR	ATION UNITS:	MG/L		. * •	. •					
CAS NO.	ANALYTE			Concentration	С	Q	М		MDL	RL
1-00-3	Chloride	•		346			IC:		3.4	10

Surro	gate	Recovery	Control Limits	Qualifier
Dichloroacetate - DC	A	90.6	90 - 115	

and the second s	· ·		
Color Before:	Clarity Before:	Texture:	
Color After:	Clarity After:	Artifacts:	<u> </u>
Comments:			
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# INORGANIC ANALYSIS DATA SHEET

		_					
Lab Name:	Spectrum Analyti	cal, Inc. Contra	ct: Smokey Mountain	Smelters 073-		SMSSW1	3
Lab Code :	PEL	Case No.:	SAS No:		SDG No.:	3510993	
Matrix: V	VATER	MATTER AND	Lab Sample iD:	351099304			-
Level:(low/me	ed) LOW		Date Received:	11/14/2013			
PercentSolid	s: 0		Station ID:	,		-	

CAS NO.	ANALYTE	Concentration	С	,a	м	MDL	RL
47752-0-60-0	Alkalinity (Total)	190	1		IS	2.5	5
7664-41-7	Ammonia	-0.0351 0.25	ux	10-2	AS	0.02	0.25
7782-41-4	Fluoride	1	U		IC .	0.33	1
25-90-0	Nitrate-N	1.4	1		IC .	0.036	0.1
15-90-0	Nitrite-N	0.1	U		IC	0.031	0.1
14265-44-2	ortho-Phosphate-P	1	U		IC	0.24	1
1-01-0	Residue, Filterable (TDS)	576	1		GR	10	10
3-03-5	Sulfate	19.2	1		IC	0.32	1
18496-25-8	Sulfide	2	· U		Τ	0.08	2
1012_5	TOC	0.804	J	0-2	TC	0.31	1

Surrogate	- Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	94.0	90 - 115	
	- · · · · · · · · · · · · · · · · · · ·	•	1
	•	•	

Color Before:	Clarity Before:	Texture :	
Color After	Clarity After:	Artifacts:	,
Comments:	<u> </u>		
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# INORGANIC ANALYSIS DATA SHEET

•		Er A demple ise.
Lab Name: Spectrum Analytical, Inc. Con	ntract: Smokey Mountain Smelters 073-	SMSSW13DL1
Lab Code : PEL Case No.:		3 No.: 3510993
Matrix: WATER	Lab Sample ID: 351099304DL1	
Level:(low/med) LOW	Date Received: 11/14/2013	
PercentSolids: 0	Station ID:	
		•

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	C	ď	М	MDL	RL
	and the second second	100					
1-00-3	Chloride	155			IC	3.4	10

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	90.4	90 - 115	

Color Before:	Clarity Before: _	· · · · · · · · · · · · · · · · · · ·	Texture :
Color After:	Clarity After:		Artifacts:
Comments:			
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# INORGANIC ANALYSIS DATA SHEET

						EFA Sample	INO.
Lab Name:	Spectrum Analyti	cal, inc.	Contract:	SMOKEY MOUN	TAIN SMELTE	SMSMW10	В
Lab Code :	PEL	Case No.:		SAS No:		SDG No.: 3510976	· · · · · · · · · · · · · · · · · · ·
Matrix: <u>V</u>	VATER			Lab Sample ID:	351097601	Attenuated physical states	
Level:(low/m	ed) LOW			Date Received:	11/13/2013		<del></del>
PercentSolid	s: <u>0</u>			Station ID:		-	·

# CONCENTRATION UNITS: MG/L

Color After:

CAS NO.	ANALYTE	Concentration	C	Q	vi 📗	MDL	RL
47752-0-60-0	Alkalinity (Total)	403		IS		0.5	1
7664-41-7	Ammonia	0.25	U	AS		0.02	0.25
1-00-3	Chloride	77.3	1	IC		0.34	1
7782-41-4	Fluoride	8.3		IC		0.33	1
25-90-0	Nitrate-N	2.9	T	IC		0,036	0.1
15-90-0	Nitrite-N	0.1	U	IC		0.031	0.1
14265-44-2	ortho-Phosphate-P	1	U	IC.		0.24	1
1-01-0	Residue, Filterable (TDS)	2430		GR		10	10
18496-25-8	Sulfide	2	U	Т		0.08	2
1012_5	TOC	1.36		TC		0.31	1

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	90.0	90 - 115	
· ·			
	4.5		
Color Before:	Clarity Before:	Texture :	

Comments:

Clarity After:

Artifacts:

			VORGANIC	ANALYSIS DATA	SHEET							
							EPA	A Sample No.				
Lab Name:	Spectrum Ana	alytical, Inc.	Contract:	SMOKEY MOUN	ITAIN SME	LTE	SM	SMW10BDL1				
Lab Code :	PEL	Case No.:		SAS No:		SDG	No.: 3510	976	e ug grandrumpal			
Matrix: M	ATER .	<u> </u>		Lab Sample ID:	3510976	01DL1				٠.		
Level:(low/me	d) LOW			Date Received:	11/13/20	13	•		-			
PercentSolids	: 0			Station ID:								
								-				
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CONCENTRA	TION UNITS:	MG/L	·							-	•	<del></del>
CAS NO.	ANALYTE			Concentration	C	:   a	М		MDL		RL.	
3-03-5	Sulfate			782			IC		8		25	]
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		·	<u></u>		<u>.</u>							
Dichioroaceta	Surrogate		Recovery 90.4	Control 90 -		Qualif	ier '			****		
Dictiological	ite - DCA		90.4	90 •	113	·				1		
•			*				•					
olor Before:		Clarity Befo	re:	Textu	ıre :					Van de	- 32	
olor After:		Clarity Afte	г	Artifa	acts:					, S.	12.	
omments:	•							*			· · · · · · · · · · · · · · · · · · ·	

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# INORGANIC ANALYSIS DATA SHEET

	EFA Sample No.
Lab Name: Spectrum Analytical, Inc. Conf	tract: SMOKEY MOUNTAIN SMELTE SMSMW11A
Lab Code : PEL Case No.:	SAS No: SDG No.: 3510976
Matrix: WATER	Lab Sample ID: 351097602
Level:(low/med) LOW	Date Received: 11/13/2013
PercentSolids: 0	Station ID:

CAS NO.	CAS NO. ANALYTE		С	α	M MD		MDL	. RL	
47752-0-60-0	Alkafinity (Total)	1300			IS		0.5	1	
7664-41-7	Ammonia	88.2		<u>.</u>	AS		0.02	0.25	
25-90-0	Nitrate-N	3			IC .		0.036	0.1	
15-90-0	Nitrite-N	0.1	U		IC		0.031	0.1	
14265-44-2	ortho-Phosphate-P	1	Ú		IC		0.24	1	
1-01-0	Residue, Filterable (TDS)	11500			GR		10	10	
18496-25-8	Sulfide	0.2	J	0-2	T	-	0.16	4	
1012_5	тос	20.4			TC		0.31	1	

<u> </u>	JulioSure	Recovery	. Control Links	Qualifier	1 .	
Dichloroad	etate - DCA	100.0	90 - 115		] .	
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Color Before: _	1 - 12	Clarity Before:	Texture :	· ·	e de la companya della companya della companya de la companya della companya dell	·
Color After :		Clarity After:	Artifacts:			
Comments:			÷			

INORGANIC ANALYSIS DATA SHEET

					Er A Sample No.
Lab Name: _S	Spectrum Analytical, Inc.	Contract:	SMOKEY MOUNTA	VIN SMELTE	SMSMW11ADL1
Lab Code : P	EL Case No.:		SAS No:	s	DG No.: 3510976
Matrix: WA	ΓER		Lab Sample ID: 3	151097602DL1	·
Level:(low/med)	LOW		Date Received:	11/13/2013	
PercentSolids:	0	e* -	Station ID:		

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	С	Q	М	MDL	RL
7782-41-4	Fluoride	. 159.			IC	 3.3	10
3-03-5	Sulfate	186	31		IC	3.2	10

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	90.0	90 - 115	
	. ;`		
Color Before:	Clarity Before:	Texture :	<del>,</del> ;; -:
Color After :	Clarity After:	Artifacts:	
Comments:			

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# INORGANIC ANALYSIS DATA SHEET

		Er A dample No.
Lab Name: Spectrum Analytical, Inc. Contract:	SMOKEY MOUNTAIN SMELTE	SMSMW11ADL2
Lab Code : PEL Case No.:	SAS No: SI	OG No.: 3510976
Matrix: WATER	Lab Sample ID: 351097602DL2	
Level:(low/med) LOW	Date Received: 11/13/2013	
PercentSolids: 0	Station ID:	

CONCENTRATION UNITS: MG/L

Surrogate

CAS NO.	ANALYTE	·	Concentration	С	Q	M	4.	MDL	RL
1-00-3 C	Chloride		3660			IC		34	100

Dichloroacetate - DCA	94.0	90 - 115					
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•	•						
Color Before:	Clarity Before:	Texture :	÷				
Color After:	Clarity After:	Artifacts:			e e e e e		
Comments:				<del> :: .</del>	• • •		
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Control Limits

Qualifier

Recovery

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# INORGANIC ANALYSIS DATA SHEET

		El A palliple No.
Lab Name: Spectrum Analytical, Inc. Contract:	SMOKEY MOUNTAIN SMELTE	SMSMW11B
Lab Code : PEL Case No.:	SAS No:	SDG No.: 3510976
Matrix: WATER	Lab Sample ID: 351097603	
Level:(low/med) LOW	Date Received: 11/13/2013	<del></del>
PercentSolids: 0	Station ID:	

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	•	Concentration	С	Q	М		MDL.	RL
47752-0-60-0	Alkalinity (Total)	· · · · · · · · · · · · · · · · · · ·	1480		<del></del>	IS		0.5	1
7664-41-7	Ammonia		99.1	1		AS		0.02	0.25
25-90-0	Nitrate-N		2.4	1		IC		0.036	0.1
15-90-0	Nitrite-N		0.1	U		IC		0.031	0.1
14265-44-2	ortho-Phosphate-P	•	1	U		IC	·	0.24	1.
1-01-0	Residue, Filterable (TDS)		11400			GR		10	10
18496-25-8	Sulfide		2	U		T		0.08	2
1012_5	TOC	<u> </u>	21.5			TC		0.31	· 1

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	102.0	90 - 115	
•			•
Color Before:	Clarity Before:	Texture:	·
Color After :	Clarity After:	Artifacts:	

Comments:

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# INORGANIC ANALYSIS DATA SHEET

Lab Name: Spectrum Analytical,	Inc. Contract:	SMOKEY MOUN	TAIN SMELTE	SMSMW11BDL1		
	ase No.:	SAS No:		DG No.: 3510976		
Matrix: WATER		Lab Sample ID:	351097603DL1			
Level:(low/med) LOW :		Date Received:	11/13/2013			
PercentSolids: 0	·	Station ID:				-
		. *				
			•			. •
CONCENTRATION UNITS: MG/	<i>n</i>	•				

EPA Sample No.

CAS NO.	ANALYTE	Concentration	c a	M	MDL RL
7782-41-4	Fluoride	144		IC.	3.3 10
3-03-5	Sulfate	206		IC	3.2 10

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	91.0	90 - 115	
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Color Before:	Clarity Before:	l exture :		
Color After:	Clarity After:	Artifacts:		
Comments:			- <b>-</b>	

INORGANIC ANALYSIS DATA SHEET

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							E17(0	arripio 110.		
Lab Name:	Spectrum Analy	rtical, Inc.	Contract:	SMOKEY MOUN	TAIN SMELTE	<u> </u>	SMSN	W11BDL2		•
Lab Code :	PEL	Case No.:		SAS No:		SDG No.:	351097	6	-	
Matrix:	WATER	····		Lab Sample ID:	351097603DI	L2				
Level:(low/m	ed) LOW	<del></del>		Date Received:	11/13/2013				·	
PercentSolic	ls: <u>0</u>	<u></u>		Station ID:		·			<u>.                                    </u>	1
		•	•					-		•
CONCENTR	RATION UNITS:	MG/L						. •	<u> </u>	
CAS NO.	ANALYTE			Concentration	C		м	,	MDI	RL

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Surrogate	Recovery	Control Limits	Qualifier .
Dichloroacetate - DCA	90:4	90 - 115	4.5 1 5 10.5 10.5

Color Before:	Clarity Before:	Texture :
Color After :	Clarity After:	Artifacts:
Comments:		
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Chloride

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### INORGANIC ANALYSIS DATA SHEET

4							El / Campic	110,	_
Lab Name:	Spectrum Analyti	ical, Inc.	Contract:	SMOKEY MOUN	TAIN SMELTE		SMSMW1	28	_
Lab Code :	PEL	Case No.:		SAS No:	-	SDG No.:	3510976		
Matrix: W	ATER	· ·		Lab Sample ID:	351097604				
Level:(low/me	d) LOW	٠.		Date Received:	11/13/2013		· · · · · · · · · · · · · · · · · · ·		
PercentSolids	s: <u>0</u>	· ·		Station ID:	<del></del>			\	

CONCENTRATION UNITS: MG/L

Surrogate

CAS NO.	ANALYTE	Concentration	С	Q	М	MDL	RL
47752-0-60-0	Alkalinity (Total)	410			IS	0.5	1
7664-41-7	Ammonia	0.382			AS	0.02	0.25
7782-41-4	Fluoride	1	U		IC	0.33	1
25-90-0	Nitrate-N	15.8	F-E-	-	IC.	0.036	0.1
15-90-0	Nitrite-N	0.044	J	9-2	IC	0.031	0.1
14265-44-2	ortho-Phosphate-P	1	U		IC	0.24	1
1-01-0	Residue, Filterable (TDS)	3160			GR	10	10
18496-25-8	Sulfide	0.1	· J	9-2	T.	0.08	2
1012_5	TOC	2.2			TC	0.31	1

Dichloroace	tate - DCA 100.0	90 - 115		
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Color Before:	Clarity Before:	Texture :	<del> </del>	
Color After:	Clarity After:	Artifacts:		was the in the in
Comments:	The section			A. + WV [7]
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Control Limits

Recovery

Qualifier

# INORGANIC ANALYSIS DATA SHEET

	•	EPA Sample No.
Lab Name: Spectrum Analytical, Inc. Contract:	SMOKEY MOUNTAIN SMELTE	SMSMW12BDL1
Lab Code : PEL Case No.:	SAS No:	OG No.: 3510976
Matrix: WATER	Lab Sample ID: 351097604DL1	
Level:(low/med) LOW	Date Received: 11/13/2013	
PercentSolids: 0	Station ID:	

CAS NO.	ANALYTE	Concentration	С	a	М	MDL	RL
1-00-3	Chloride	368			IC .	 .3.4.	10
25-90-0	Nitrate-N	15.8	J.H	Ъ	. IC	0.36	- 1
3-03-5	Sulfate	212			C	3.2	10

Surrogate		Recovery	 Control Limits	Qualifier
Dichloroacetate - DCA		90.2	 90 - 115	*
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Color Before:	<del></del>	Clarity Before	:	Texture :	· .
Color After:	<u>.                                    </u>	Clarity After	· 	· Artifacts:_	<del> </del>
Comments:					

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# INORGANIC ANALYSIS DATA SHEET

	El A Sample No.	
Lab Name: Spectrum Analytical, Inc. Contract:	SMOKEY MOUNTAIN SMELTE SMSMW13B	
Lab Code : PEL Case No.:	SAS No: SDG No.: 3510976	
Matrix: WATER	Lab Sample ID: <u>351097605</u>	
Level:(low/med) LOW	Date Received: 11/13/2013	<b>.</b>
PercentSolids: 0	Station ID:	<b>-</b>

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	С	a	: М	MDL	RL
47752-0-60-0	Alkalinity (Total)	175			ıs	 0.5	1
7664-41-7	Ammonia	0.0832	J	9-2	AS	0.02	0.25
1-00-3	Chloride	31.7			iC	 0.34	1
7782-41-4	Fluoride	0.42	J	0-2	IC	0.33	1
25-90-0	Nitrate-N	1.7			IC	0.036	0.1
15-90-0	Nitrite-N	0.1	٦		IC .	0.031	0.1
14265-44-2	ortho-Phosphate-P	1 .	U		IC	0.24	1
1-01-0	Residue, Filterable (TDS)	848			GR	10	10
18496-25-8	Sulfide	0.2	J	0-2	T	0.08	. 2
1012_5	TOC	0.633	J ·	4-2	TC	0.31	1

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	98.0	90 - 115	

Color Before:	Clarity Before:	Texture :
Color After:	Clarity After:	Artifacts:
Comments:	,	

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# INORGANIC ANALYSIS DATA SHEET

Lab Name: Spectrum Analytical, Inc. Con	tract: SMOKEY MOUNTAIN SMELTE	SMSMW13BDL1	1.
Lab Code : PEL Case No.:	SAS No: SE	OG No.: 3510976	. *
Matrix: WATER	Lab Sample ID: 351097605DL1	<u> </u>	
Level:(low/med) LOW	Date Received: 11/13/2013		
PercentSolids: 0	Station ID:		
	•		
CONCENTRATION/ NUTO		•	
CONCENTRATION UNITS: MG/L		<u> </u>	

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Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	90.4	90 - 115	

CAS NO.

3-03-5

ANALYTE

Sulfate

Color Before:	Clarity Before:	Texture :
Color After :	Clarity After:	Artifacts:
Comments:		

# INORGANIC ANALYSIS DATA SHEET

		EFA Gample 140.
Lab Name: Spectrum Analytical, Inc. Contract: S	SMOKEY MOUNTAIN SMELTE	SMSSW01
Lab Code: PEL Case No.:	SAS No: SI	OG No.: 3510976
Matrix: WATER	Lab Sample ID: 351097606	melana ab
Level:(low/med) LOW	Date Received: 11/13/2013	
PercentSolids: 0	Station ID:	

CAS NO.	ANALYTE	Concentration	С	Q.	М	MDL	RL
47752-0-60-0	Alkalinity (Total)	164	-		IS	 0.5	1
7664-41-7	Ammonia ,	0.055	J	9-2	AS	0.02	0.25
1-00-3	Chloride	3.7	U,		IC	0.34	1
7782-41-4	Fluoride	1	U		IC .	0.33	1
25-90-0	Nitrate-N	0.48			IC	 0.036	0.1
15-90-0	Nitrite-N	0.11			1C	 0.031	0.1
14265-44-2	ortho-Phosphate-P	1	U		IC	 0.24	1
1-01-0	Residue, Filterable (TDS)	270			GR	10	10
3-03-5	Sulfate	4	U,	8-4	IC	0.32	1
18496-25-8	Sulfide	0.1	J	4-2	Τ.	0.08	2
1012_5	тос	0.696	J	4-2	TC	 0.31	1

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	94.0	90 - 115	

Color Before:	Clarity Before:	Texture :
Color After:	Clarity After:	Artifacts:
Comments:		

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# INORGANIC ANALYSIS DATA SHEET

		EPA Sample No.
Lab Name: Spectrum Analytical, inc. Contract:	SMOKEY MOUNTAIN SMELTE	SMSSW04
Lab Code : PEL Case No.:	SAS No: SDG	No.: 3510976
Matrix: WATER	Lab Sample ID: 351097607	
Level:(low/med) LOW	Date Received: 11/13/2013	
PercentSolids: 0	Station ID:	بالمراق ما والماد المراق والمراقب والمراقب والمراقب والمراقب والمراقب والمراقب والمراقب والمراقب والمراقب والم

CAS NO.	ANALYTE		Concentration	С	Q	М	MDL	RL
47752-0-60-0	Alkalinity (Total)	<del></del>	235			IS .	0.5	1
7664-41-7	Ammonia		0.0769	J	Q-2	AS	0.02	0.25
7782-41-4	Fluoride	<del></del>	7.3			IC	0.33	1
25-90-0	Nitrate-N		0.1	C		IC	0.036	0.1
15-90-0	Nitrite-N		0.16		· 7	IC :	0.031	0.1
14265-44-2	ortho-Phosphate-P	<u> </u>	1 .	Ü		IC	0.24	1
1-01-0	Residue, Filterable (TDS)		7320		•	GR	10	10
3-03-5	Sulfate		71.2	1	7	IC .	0.32	1
18496-25-8	Sulfide		2.	U		Т	0.08	2
1012_5	TOC		4.42		<u> </u>	TC	0.31	1

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	96.0	90 - 115	
			<del></del>

Color Before:	Clarity Before:	Texture :
Color After:	Clarity After:	Artifacts:
Comments:	· •	

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# INORGANIC ANALYSIS DATA SHEET

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Lab Name: Spectrum Analytical, Inc. Contract:	SMOKEY MOUNTAIN SMELTE	SMSSW04DL1	
Lab Code : PEL Case No.:	SAS No:	SDG No.: 3510976	٠.
Matrix: WATER	Lab Sample ID: 351097607DL	1	
Level:(low/med) LOW	Date Received: 11/13/2013		
PercentSolids: 0	Station ID:		٠.
CONCENTRATION UNITS: MG/L			Jan e

EPA Sample No.

<u>.</u>				
Surrogate	Recovery	Control Limits	Qualifier	ĺ
Dichloroacetate - DCA	90.4	90 - 115		Ė.

CAS NO.

1-00-3

ANALYTÉ

Chloride

Color Before:	<u> </u>	Clarity Before:	Texture :		en e
Color After:		Clarity After:	Artifacts:		A Comment Description
Comments:	1,6 % 1	-			Altoward Control
				<del></del>	g transferance (1746 to 1867) Berlind Albandaria

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### INORGANIC ANALYSIS DATA SHEET

	EFA Sample No.
Lab Name: Spectrum Analytical, Inc. Contract:	SMOKEY MOUNTAIN SMELTE SMSSW08
Lab Code : PEL Case No.:	SAS No:SDG No.: <u>3510976</u>
Matrix: WATER	Lab Sample ID: 351097608
Level:(low/med) LOW	Date Received: 11/13/2013
PercentSolids: 0	Station ID:

CAS NO.	ANALYTE	Concentration	С	Q	M		MDL	RL
477700000	Aller to Property	057			10			
47752-0-60-0	Alkalinity (Total)	255			IS		0.5	1
7664-41-7	Ammonia	0.0822	J	4-2	AS	<u> </u>	0.02	0.25
7782-41-4	Fluoride	1	Ú		IC		0.33	1
25-90-0	Nitrate-N	2	•		IC	,	0.036	0.1
15-90-0	Nitrite-N	0.045	: ل	4,-2	· IC	1	0.031	0.1
14265-44-2	ortho-Phosphate-P	. 1	U		IC	7 . i	0.24	•1
1-01-0	Residue, Filterable (TDS)	2980		_	GR ·		10	10
3-03-5	Sulfate	33.3		: 1	IC.		0.32	1
18496-25-8	Sulfide	2	U		Ŧ		0.08	2
1012 5	TOC	1.38		.	TC		0.31	1

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	96.0	90 - 115	

Color Before:	Clarity Before:	Texture :
Color After:	Clarity After:	Artifacts:
Comments:		
Land American		

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# INORGANIC ANALYSIS DATA SHEET

					EPA S	ample No.		
Lab Name: Spectrum Analytical, Inc.	Contract:	SMOKEY MOUNT	TAIN SMELT	<u>E</u> .	SMS	SW08DL1		
Lab Code : PEL Case No.	:	SAS No:		SDG No.:	351097	6		
Matrix: WATER	•	Lab Sample ID:	3510976080	DL1		•		
Level:(low/med) LOW	· · · · · · · · · · · · · · · · · · ·	Date Received:	11/13/2013		٠	: <u></u>	<u> </u>	and the second
PercentSolids: 0		Station ID:			,			in the state of th
,. — — — — — — — — — — — — — — — — — — —								
		, ,					•	
	•					•		
CONCENTRATION UNITS: MG/L		·	' .	<del>,                                      </del>		<u> </u>	· .	<u> </u>
CAS NO. ANALYTE		Concentration	С	Q	M	1.1	MDL	RL
1-00-3 Chloride		420			IC		3.4	10
						1		
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	•	1 1 1						
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	·		•	•				
							•	
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	•							
		•						• .
		•			•	•		
					-			
Surrogate	Deserve	l Comba	Limits	Qualifier	_		1.	
Dichloroacetate - DCA	Recovery 95.8		- 115	Quantier	-			
			· · · · · · · · · · · · · · · · · · ·		<del></del> !	• •		*
		•						
Color Before: Clarity	Before:	Tex	ture :	<u> </u>		-	<i>:</i> · · ·	u Days, North (Inc.)
Color After: Clarity	After:	Art	ifacts:	<del></del>			transfer of the second	wi yylele i i i i
Comments:	· · · · · · ·							to diamentale in the
					7.			الحاوم العرابطة السيمان والووريوات. المراجع والرابع المحاسبات التراجع

# INORGANIC ANALYSIS DATA SHEET

				EPA Sample No.
Lab Name: Spectrum Analytical,	Inc. Contract:	SMOKEY MOUNT	TAIN SMELTE	SMSSW08SPRING
Lab Code : PEL Cas	se No.:	SAS No:		DG No.: 3510976
Matrix: WATER		Lab Sample ID:	351097609	
Level:(low/med) LOW	Walter Commence	Date Received:	11/13/2013	
PercentSolids: 0		Station ID:		

CAS NO.	ANALYTE	2	Concentration	С	Q	М		MDL	RL
47752-0-60-0	Alkalinity (Total)		280			IS .		0.5	1
7664-41-7	Ammonia		0.142	J	0-2	AS		0.02	0.25
7782-41-4	Fluoride		0.43	J	4-2	IC		0.33	1
25-90-0	Nitrate-N		2.6			Ю		0.036	0.1
15-90-0	Nitrite-N		0.039	J	9-2	IC		0.031	0.1
14265-44-2	ortho-Phosphate-P	•	1	U	•	IC		0.24	1
1-01-0	Residue, Filterable (TDS)		3420			GR		10	10
3-03-5	Sulfate		36			iC		0.32	1
18496-25-8	Sulfide		0.2	J	0-2	T		80.0	2.
1012_5	TOC		1.23			TC	,	0.31	1

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	94.0	90 - 115	

Color Before;	Clarity Before:	Texture :
Color After:	Clarity After:	Artifacts:
Comments:		•
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Lab Name   Spectrum Analytical, Inc.   Contract   SMOKEY MOUNTAIN SMELTE   SMSSW089PRINGDL1	l ah Nama:	Spectrum Apply	dical Inc	Caninat	SMUNE.	/ MOLIBI	TAIST	Mae'i Te	_ [		ample No. 8SPRINGI	DL1			
Matrix:         WATER         Lab Sample ID:         351097609DL1           Level:(flow/med)         LOW         Date Received:         11/13/2013           PercentSolids:         0         Station ID:    **CONCENTRATION UNITS: MG/L  **CAS NO.** ANALYTE**  **Concentration**  **Concentration**  **C Q M MDL RL  -00-3 Chloride**  **Chloride**  **Concentration**  **C Q M MDL RL  -00-3 IC Notice**  **Concentration**  **C Q M MDL RL  -00-3 IC Notice**  **Concentration**  **C Q M MDL RL  -00-3 IC Notice**  **Concentration**  **C Q M MDL RL  -00-3 IC Notice**  **Concentration**  **C Q M MDL RL  -00-3 IC Notice**  **Concentration**  **C Q M MDL RL  -00-3 IC Notice**  **Concentration**  **C Q M M MDL RL  -00-3 IC Notice**  **Concentration**  **C Q M M MDL RL  -00-3 IC Notice**  **Concentration**  **C Q M M MDL RL  -00-3 IC Notice**  **Concentration**  **C Q M M MDL RL  -00-3 IC Notice**  **Concentration**  **C Q M M MDL RL  -00-3 IC Notice**  **Concentration**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3 IC Notice**  **C Q M M MDL RL  -00-3	Lab Name:	** * * *		-	***************************************		IAIN S	MELIE			<del></del>				
Level;(Dw/med)         LOW         Date Received:         1/1/13/2013           PercentSolids:         0         Station ID:    CONCENTRATION UNITS: MG/L  CAS NO. ANALYTE  Concentration  C  Q  M  MDL  RL  -00-3  Chloride  451  IC  3.4  10  Surrogate  Recovery  Control Limits  Qualifier  Dichloroscetate - DCA  95.2  90 - 115  Dichloroscetate - DCA  95.2  90 - 115	٠		0,000 110 ,				35100	76090		331037	<u> </u>				
PercentSolids: 0   Station ID:															
CONCENTRATION UNITS: MG/L   CAS NO.   ANALYTE		· · · · · · · · · · · · · · · · · · ·	rente	•				72010	···					·	
CAS NO.         ANALYTE         Concentration         C         Q         M         MDL         RL           1-00-3         Chloride         451         IC         3.4         10    Surrogate  Surrogate  Recovery  Control Limits  Qualifier  Dichloroscetate - DCA  95.2  90 - 115	,		<del></del>		J			<del></del>							
CAS NO.         ANALYTE         Concentration         C         Q         M         MDL         RL           -00-3         Chloride         451         IC         3.4         10    Surrogate  Surrogate  Recovery  Control Limits  Qualifier  Dichloroscetate - DCA  95.2 90 - 115	-				. •	٠									
CAS NO.         ANALYTE         Concentration         C         Q         M         MDL         RL           -00-3         Chloride         451         IC         3.4         10    Surrogate  Surrogate  Recovery  Control Limits  Qualifier  Dichloroscetate - DCA  95.2 90 - 115														,	
Chloride	CONCENTRA	ATION UNITS:	MG/L							<b>-</b>					<b>-</b>
Surrogate Recovery Control Limits Qualifier  Dichloroacetate - DCA 95.2 90 - 115	CAS NO.	ANALYTE	•		Conc	entration		С	α	. м		MDI		RL	
Dichloroacetate - DCA 95.2 90 - 115	00-3	Chloride			451					IC		3.4		10	
Dichloroacetate - DCA 95.2 90 - 115					•							.•	.*		
Dichloroacetate - DCA 95.2 90 - 115	-					•		٠						•	
Dichloroacetate - DCA 95.2 90 - 115				· .						٠					
Dichloroacetate - DCA 95.2 90 - 115			era										•	·	
Dichloroacetate - DCA 95.2 90 - 115			ta y to a district.							•					
Dichloroacetate - DCA 95.2 90 - 115			7 a5				,		٠.						
Dichloroacetate - DCA 95.2 90 - 115								•							
Dichloroacetate - DCA 95.2 90 - 115										• .				•	
Dichloroacetate - DCA 95.2 90 - 115									•						
Dichloroacetate - DCA 95.2 90 - 115															
Dichloroacetate - DCA 95.2 90 - 115												•			
Dichloroacetate - DCA 95.2 90 - 115							٠								
									Qualifie	r		•	:	•	
Color Before: Clarity Before: Texture :	Dichloroace	etate - DCA		95.2		90	- 115		· -						
Color Before: Clarity Before: Texture :											•	•			
	olor Before:	·	Clarity Be	fore:	<del></del>	Tex	ture :		· ·						

Comments:

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### INORGANIC ANALYSIS DATA SHEET

		EPA Sample No.
Lab Name: Spectrum Analytical, Inc.	Contract: SMOKEY MOUNTAIN SMELTE	SMSSW09
Lab Code : PEL Case No.	SAS No:	SDG No.: 3510976
Matrix: WATER	Lab Sample ID: 351097610	na jennijet na drojetjum.
Level:(low/med) LOW	Date Received: 11/13/2013	والمعاون والمراجع والمعاونة والمعاونة والمعاونة والمعاونة والمعاونة والمعاونة والمعاونة والمراجع والمعاونة والم
PercentSolids: 0	Station ID:	

CAS NO.	ANALYTE	Concentration	С	Q	М	·	MDL	RL
47752-0-60-0	Alkalinity (Total)	240		<u> </u>	IS		0.5	1.00
7664-41-7	Ammonia	0.0496	. j	4-2	AS		0.02	0.25
7782-41-4	Fluoride	0.43	J	0-2	IC	)	0.33	1.
25-90-0	Nitrate-N	2.6			IC		0.036	0:1
15-90-0	Nitrite-N	0.047	J	0-2	IC		0.031	0.1
14265-44-2	ortho-Phosphate-P	1	U		IC	·	0.24	.1
1-01-0	Residue, Filterable (TDS)	2640 .			GR		10	10
3-03-5	Sulfate	34			IC .		0.32	v1. v
18496-25-8	Sulfide	0.401	J	0-2	T		0.08	2
1012_5	TOC	1.28			TC		0.31	1

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	96.0	90 - 115	

Color Before:	Clarity Before:	Texture :
Color After:	Clarity After:	Artifacts:
Comments:		
		<del></del>

# INORGANIC ANALYSIS DATA SHEET

			-			· _	EPA Sa	mple No.		•
Lab Name:	Spectrum Analy	tical, Inc.	_ Contract:	SMOKEY MOUN	TAIN SMELTE		SMSS	W09DL1		
Lab Code :	PEL	Case No.:		SAS No:		SDG No	.: <u>3510976</u>	3		
Matrix: M	VATER			Lab Sample ID;	351097610D	L1				
Level:(low/me	ed) LOW.			Date Received:	11/13/2013			:		Same of
PercentSolid	s: <u>0</u>			Station ID:		**************************************		<u></u>		• . •
CONCENTR	ATION UNITS:	MG/L	· · · · · · · · · · · · · · · · · · ·							
CAS NO.	ANALYTE			Concentration	С	Q	М		MDL	RL
-00-3	Chloride	- <u> </u>		406			IC :	<del></del>	34	10

Surrogate	•	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	- 1	98.8	90 - 115	1 1

Color Before:	Clarity Before:	Texture :	
Color After :	Clarity After:	Artifacts:	18.00 at 19.00 at 19
Comments:	•		A service of the serv
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# INORGANIC ANALYSIS DATA SHEET

	EPA Sample No.
Lab Name: Spectrum Analytical, Inc. Contract:	SMOKEY MOUNTAIN SMELTE SMSSW09SPRING
Lab Code : PEL Case No.:	SAS No: SDG No.: 3510976
Matrix: WATER	Lab Sample ID: 351097611
Level:(low/med) LOW	Date Received: 11/13/2013
PercentSolids: 0	Station ID:

CAS NO.	ANALYTE	Concentration	C	Q	М	MDL	RL
47752-0-60-0	Alkalinity (Total)	250			IS	0.5	1
7664-41-7	Ammonia	0.0658	J	4-2	AS	0.02	0.25
7782-41-4	Fluoride	.1	Ų		IC	0.33	.1 .
25-90-0	Nitrate-N	1	1	i	IC.	0.036	0.1
15-90-0	Nitrite-N	0.1	U		IC	0.031	0.1
14265-44-2	ortho-Phosphate-P	1	U		IC	0.24	1
1-01-0	Residue, Filterable (TDS)	584			GR	10	10
3-03-5	Sulfate	17:8			IC	0.32	1
18496-25-8	Sulfide	0.2	J	0-2	Т	0.08	2
1012_5	TOC	0.795	J	0-2	тс	0.31	1

Surrogate	 Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	 94.0	90 - 115	

Color Before:	Clarity Before:	Texture :
Color After:	Clarity After:	Artifacts:
Comments:		•

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### INORGANIC ANALYSIS DATA SHEET

	•						EFA Sample	NO.	<u>.</u> `
Lab Name:	Spectrum Analyti	ical, Inc.	Contract:	SMOKEY MOUN	TAIN SMELTE	<u> </u>	MSSW09SPR	NGDL1	
Lab Code :	PEL	Case No.:		SAS No:		SDG No.:	3510976		
Matrix: V	VATER			Lab Sample ID:	351097611D	<u>L1</u>			
Level:(low/m	ed) LOW			Date Received:	11/13/2013			<u> </u>	
PercentSolid	ls: 0			Station ID:					
	-								

CAS NO.	ANALYTE	Concentration	С	Q	M	MDL	RL
1-00-3	Chloride	131			,IC	1.7	5

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	91.6	90 - 115	•
		•	

Color Before:	Clarity Before:	· .	Texture :			
Color After:	Clarity After:	<u> </u>	Artifacts:			
Comments:	:					
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# INORGANIC ANALYSIS DATA SHEET

		EPA Sample No.
Lab Name: Spectrum Analytical, Inc. Contract:	SMOKEY MOUNTAIN SMELTE	SMSSW20
Lab Code : PEL Case No.:	SAS No:	DG No.: 3510976
Matrix: WATER	Lab Sample ID: 351097612	Pildris Ima
Level:(low/med) LOW	Date Received: 11/13/2013	
PercentSolids: 0	Station ID:	

CAS NO.	ANALYTE	Concentration	, C	Q	М		MDL	RL
47752-0-60-0	Alkalinity (Total)	.155		<del> </del>	IS		0.5	1
7664-41-7	Ammonia	0.0677	J	0-2	AS		0.02	0.25
1-00-3	Chloride	58.8			IC		0.34	1.
7782-41-4	Fluoride	1	U		ic		0.33	1
25-90-0	Nitrate-N	0.2			IC	1	0.036	0.1
15-90-0	Nitrite-N	0.1	U		IC		0.031	0.1
14265-44-2	ortho-Phosphate-P	1.	U		IC :		0.24	1
1-01-0	Residue, Filterable (TDS)	308	1		GR		10	10
3-03-5	Sulfate	12.2			iC		0.32	1:
18496-25-8	Sulfide	0.2	J	0-2	Τ,		0.08	2
1012_5	TOC	1.72			TC		0.31	1

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	94.0	90 - 115	

Color Before:	Clarity Before:	Texture :
Color After:	Clarity After:	Artifacts:
Comments:	en i market i i i i i i i i i i i i i i i i i i i	·

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# INORGANIC ANALYSIS DATA SHEET

					EPA Sample No.				
Lab Name:	Spectrum Analyti	cal, Inc.	Contract:	Smokey Mountain	SMSMW02A				
Lab Code :	PEL	Case No.:	V rises (1-10) regulator y quantum	SAS No:	÷,	SDG No.:	3511009	·	
Matrix:	WATER			Lab Sample ID:	351100901	·			
Level:(low/m	ed) LOW		•	Date Received:	11/15/2013			<u> </u>	· .
PercentSolid	ls: <u>0</u>			Station ID:		· .			

CAS NO.	ANALYTE	Concentration	С	a .	М		MDL	RL
47752-0-60-0	Alkalinity (Total)	1050	<del> </del>		IS		5	10
7664-41-7	Ammonia	80.4		1 T. 1 T. 1 T. 1	AS		0.02	0.25
25-90-0	Nitrate-N	. 0.1	U	J. H-1	IC.		0.036	0.1
15-90-0	Nítrite-N	1.6	7	H-/	IC		0.031	0.1
14265-44-2	ortho-Phosphate-P	1.2	1,7	H-1	IC .		0.24	1.
1-01-0	Residue, Filterable (TDS)	-5890			GR		10	10
3-03-5	Sulfate	1	UJ	H-/	IC :		0.32	1
18496-25-8	Sulfide	0.802	J	0-2	Т		0.08	2
1012_5	TOC	233		7	TC .	:	0.31	1

Surrogate		Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	110.0		90 - 115	
	•			<del></del>
Color Before:	Clarity Befor		Texture :	
Color After:	Clarity	After:	Artifacts:	<del></del> .
Comments:		•		

# INORGANIC ANALYSIS DATA SHEET

	•			.*			EPA Sar	nple No.		
Lab Name:	Spectrum Analytical, Inc.		Contract;	Smokey Mountain	Smelters 073		SMSMW02ADL1		. ,	
Lab Code :	PEL	Case No.:	Wie i build how a large may per a p	SAS No:		SDG No.:	3511009			
Matrix: V	VATER	di Irani ma	: •	Lab Sample ID:	351100901D	L1			٠.	
Level:(low/me	ed) LOW			Date Received:	11/15/2013					• ."
PercentSolid	s: 0	**************************************		Station ID:				·		
. *		•				1				
CONCENTR	ATION UNITS:	MG/L								
CAS NO.	ANALYTE			Concentration	С	a	м		MDL	RL

Concentration

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	100.8	90 - 115	

Fluoride

Color Before:	Clarity Before:	Texture:
Color After :	Clarity After:	Artifacts:
Comments:		

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INORGÁNIC ANALYSIS DATA SHEET

							Campio . 10.		-	
Lab Name:	Spectrum Analytical, Inc.	Contract:	Smokey Mountain	Smelters 073-		SMS	MW02ADL2	2	] .	- v
Lab Code :	PEL Case No.:		SAS No:	androgade on all productive polytechnical productions.	SDG No	.: 35110	09			
Matrix: W	ATER		Lab Sample ID:	351100901D	L2	٠				
Level:(low/me	d) LOW	<b>1</b>	Date Received:	11/15/2013						44.
PercentSolids	: <u>0</u>		Station ID:	******				·		1
4	•		*				,	•		
				•						
CONCENTRA	TION UNITS: MG/L						· <u>·</u>			
CAS NO.	ANALYTE		Concentration	С	Q	м			<b>IDL</b>	RL
1-00-3	Chloride	<u> </u>	2560	$\mathcal{J}$	H-1	IC		17		50

	Surrogate	Recovery	Control Limits	Qualifier
Dichloroace	ate - DCA	93.2	90 - 115	
	\$ · ·	•		
Color Before:		Clarity Before:	Texture :	<u>.                                    </u>
Color After :		Clarity After:	Artifacts:	· · · ·
Comments:	a Santa			•
		· · · · · · · · · · · · · · · · · · ·		

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# INORGANIC ANALYSIS DATA SHEET

	•	El A Campio No.
Lab Name: Spectrum Analytical, Inc. Contract:	Smokey Mountain Smelters 073-	SMSMW07A
Lab Code : PEL Case No.:	SAS No: S	DG No.: 3511009
Matrix: WATER	Lab Sample ID: 351100902	
Level:(low/med) LOW	Date Received: 11/15/2013	
PercentSolids: 0	Station ID:	

CAS NO.	ANALYTE		Concentration	С	Q	м	MDL	RL
47752-0-60-0	Alkalinity (Total)		1110		<u> </u>	IS	5	10
7664-41-7	Ammonia		242			AS	0.02	0.25
7782-41-4	Fluoride		1	υ		IC	0.33	1
25-90-0	Nitrate-N		3.2			iC	0.036	0.1
15-90-0	Nitrite-N		0.1	U		ic	0.031	0.1
14265-44-2	ortho-Phosphate-P	· .	1	U		IC -	0.24	1
1-01-0	Residue, Filterable (TDS)		65400			GR	10	10 ·
18496-25-8	Sulfide		4	U		T	0.16	4 .
1012_5	TOC		31.1			TC	0.31	1

Surrogate	Recovery	Control Limits	Qualifler
Dichloroacetate - DCA	112.0	90 - 115	
Color Before:	Clarity Before:	Texture :	<del></del>
olor After:	Clarity After:	Artifacts:	
omments:			

INORGANIC ANALYSIS DATA SHEET

426

Lab Name: Spectrum Analytical, Inc. Contract: Smokey Mountain Smelters 073- SMSMW07ADL1  Lab Code: PEL Case No.: SAS No: SDG No.: 3511009									
Lab Code : PEL Case No.:		SAS No:	S	DG No.:	3511009	<u> </u>			
Matrix: WATER		Lab Sample ID:	351100902DL1			:			
Level:(low/med) LOW		Date Received:	11/15/2013			· .			
PercentSolids: 0		Station ID:					٠	٠.	
CONCENTRATION UNITS: MG/L	•	•	:		and the second second				

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	95.6	90 - 115	

3-03-5

Sulfate

O. I D. f	Clarity Bafara	T
Color Before:	Clarity Before:	Texture:
Color After :	Clarity After:	Artifacts:
• • • • • • • • • • • • • • • • • • • •		•
Comments:		

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EPA Sample No.

#### US FPA-CU

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### INORGANIC ANALYSIS DATA SHEET

CONCENTRATION UNITS:

Lab Name:	Spectrum Anal	ytical, Inc.	Contract:	Smokey Mountair	Smelters 073-		SMSMW07AD	)Ļ2	٠.	
Lab Code :	PEL	_ Case No.:		SAS No:		SDG No.:	3511009	graphe hijiddicent centresterist	•	
Matrix: V	/ATER	·		Lab Sample ID:	351100902DL	2				
Level:(low/me	ed) LOW			Date Received:	11/15/2013	·				
PercentSolid	s: <u>0</u>	<del> </del>		Station ID:	<u></u>			May arrang pi pir arm war a		
. •		•						•		

EPA Sample No.

CAS NO.	ANALYTE	Concentration	С	Q	М	MDL	RL
1-00-3	Chloride	 44800	-	<u> </u>	IC	340	1000

Surrogate	- La - 1	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA		90.4	90 - 115	
		•		
olor Before:	Clarity E	Before:	Texture :	· ·
olor After:	Clarity	After:	Artifacts:	
omments:				

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# INORGANIC ANALYSIS DATA SHEET

the state of the s	EPA Sample No.
Lab Name: Spectrum Analytical, Inc. Contract:	Smokey Mountain Smelters 073- SMSMW07B
Lab Code : PEL Case No.:	SAS No: SDG No.: 3511009
Matrix: WATER	Lab Sample ID: 351100903
Level:(low/med) LOW	Date Received: 11/15/2013
PercentSolids: 0	Station ID:

CAS NO.	ANALYTE	Concentration	С	Q	М	MDL	RL
47752-0-60-0	Alkalinity (Total)	1140		<u> </u>	IS	5	10
7664-41-7	Ammonia	47.7	1 - 1	1 1 20	AS	0.02	0.25
25-90-0	Nitrate-N	9.4	1 テ	H-1	IC	0.036	0.1
15-90-0	Nitrite-N	0.1	UJ	H-1	IC	 0.031	0.1
14265-44-2	ortho-Phosphate-P	1	1.7	H-1	IC	0.24	1
1-01-0	Residue, Filterable (TDS)	33800			GR	10	10
18496-25-8	Sulfide	2	U		T	 0.08	2
1012_5	TOC	26.3			TC	0.31	. 1

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	112.0	90 - 115	
		· ·	
•			

Color Before:	Clarity Before:	Texture :
Color After:	Clarity After:	Artifacts:
Comments:		

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# INORGANIC ANALYSIS DATA SHEET

		EPA Sample No.
Lab Name: Spectrum Analytical, Inc.	Contract: Smokey Mountain Sr	neiters 073- SMSMW07BDL1
Lab Code : PEL Case No.:	SAS No:	SDG No.: 3511009
Matrix: WATER	Lab Sample ID: 3	51100903DL1
Level:(low/med) LOW	Date Received; 1	1/15/2013
PercentSolids: 0	Station ID:	
•		

CAS NO.	ANALYTE	Concentration	C	Q	М	MDL	RL
7782-41-4	Fluoride	25	UJ	4-1	IC	8.25 ·	25
3-03-5	Sulfate	1140	$\mathcal{J}$	H-1	IC	 8	25

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	97.6	90 - 115	

Color Before:	Clarity Before:	Texture :
Color After :	Clarity After:	Artifacts:
Comments:	·	

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### INORGANIC ANALYSIS DATA SHEET

			•	•	·	EPA S	ample No.		
Lab Name: Spectrum Analytical, Inc.		Contract: Smokey Mountain Smelters 073-			SMSM	<u></u>	"F		
Lab Code : PEL	Case No.:	addition of the second	SAS No:	والمراجعة والمراجعة والمراجعة المراجعة والمراجعة والمراج	SDG No	.: 3511009	)		
Matrix: WATER			Lab Sample ID:	351100903DL	.2		•		
Level:(low/med) L	-ow		Date Received:	11/15/2013					
PercentSolids: 0			Station ID:		: •		·		
	•						•		•
			•		•				
CONCENTRATION	UNITS: MG/L	· 		<u> </u>	<u> </u>	<u> </u>	<u>.</u>		
CAS NO. AN	ALYTE		Concentration	С	α .	м		MDL	RL
1-00-3 Chlor	ride	· ·	24200	7	4-1	ic		170	500

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	92.8	90 - 115	

Color After: Clarity After: Artifacts: Comments:	Color Before:		Clarity Before:	 . 1	exture :
•	Color After :	e de la companya de l	Clarity After:	/	Artifacts:
		•			

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### INORGANIC ANALYSIS DATA SHEET

						·	EPA Sample No.			
Lab Name:	Spectrum Analyt	cal, Inc.	_ Contract:	Smokey Mountain	Smelters 073-	_	SMSMW0	8A		
Lab Code :	PEL	Case No.:		SAS No:	~ par neutro por produce para page.	SDG No.:	3511009			
Matrix: V	/ATER	*****		Lab Sample ID:	351100904		•			
Level:(low/me	ed) LOW		•	Date Received:	11/15/2013			·		
PercentSolids	s: <u>0</u>			Station ID:						

CONCENTRATION UNITS: MG/

CAS NO.	ANALYTE	Concentration	C	O	М	٠.	MDL	RL
47752-0-60-0	Alkalinity (Total)	820	-		IS		10	20
7664-41-7	Ammonia	507	3.7.7		AS		0.02	0.25
25-90-0	Nitrate-N	0.1	UŢ	H-1	IC .		0.036	0.1
15-90-0	Nitrite-N	0.21	ナ	H-1	IC		0.031	0.1
14265-44-2	ortho-Phosphate-P	1.2	$\mathcal{I}$	H-1	IC		0.24	1
1-01-0	Residue, Filterable (TDS)	4570			GR		10	10
18496-25-8	Sulfide	0.2	J	0-2	T		80.0	2.
1012_5	TOC	16.8	-	7 1-	TC		0.31	1

Surrogate	Recovery	Control Limits	Qualifler
Dichloroacetate - DCA	92.0	90 - 115	
<u> </u>		<u></u>	

Color Before:	Clarity Before:	Texture :
Color After :	Clarity After:	Artifacts:
Comments:	ž.	

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### INORGANIC ANALYSIS DATA SHEET

		4 1				EPA Sain	pie IVO.	
Lab Name:	Spectrum Analytical, Inc.	Contract:	Smokey Mountair	Smelters 073-		SMSMW	8ADL1	
Lab Code :	PEL Case No	·•-	SAS No:	<u> </u>	SDG No.:	3511009		
Matrix: N	/ATER		Lab Sample ID:	351100904DL1	<u> </u>		. '	
Level:(low/me	d) LOW	•	Date Received:	11/15/2013			·	
PercentSolids	s: <u>0</u> .	•	Station ID:					
	The second secon							

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	С	a	М	MDL	RL
7782-41-4	Fluoride	192	7	4-1	C	8.25	25
3-03-5	Sulfate	86.1	1 5	H-1	C	8	25

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	94.4	90 - 115	1
: *** : **			
Color Before:	Clarity Before:	Texture :	
Color After:	Clarity After:	Artifacts:	<u> </u>
		I	
Comments:			
	······································		<del></del> _
		·	

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### INORGANIC ANALYSIS DATA SHEET

Lab Name:	Spectrum Anal	ytical, Inc.	Contract:	Smokey Mountain	Smelters 073		SMS			
Lab Code :	PEL	Case No.:	-	SAS No:		SDG No	.: 35110	09 - :	Indian Cara	
Matrix:	WATER			Lab Sample ID:	351100904	L2				
Level:(low/m	ed) LOW	· <del></del>		Date Received:	11/15/2013	·	· .	·		
PercentSolic	ls: <u>0</u>			Station ID:	****				water	
	,									
CONCENTA	RATION UNITS:	MG/L							<del> </del>	· ·
CAS NO.	ANALYTE			Concentration	С	Q	М		MDL	RL.
-00-3	Chloride			2030	5	H-1	1C		17	50

EPA Sample No.

Surrogate	Recovery	Control Limits	Qualifier	ľ
Dichloroacetate - DCA	91.6	90 - 115		١.

Color Before:	Clarity Before:	Texture :
Color After :	Clarity After:	Artifacts:
Comments:		

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### INORGANIC ANALYSIS DATA SHEET

	* · · · · ·					ELY Outil	pic 140.	
Lab Name:	Spectrum Analytical, Inc.	Contract:	Smokey Mountain	Smelters 073-	_ [	SMSS	W11	
Lab Code : _F	PEL Case No.:	- Marie Mari	SAS No:		SDG No.:	3511009		
Matrix: WA	TER		Lab Sample ID:	351100905				
Level:(low/med)	LOW	•	Date Received:	11/15/2013		· · · · · · · · · · · · · · · · · · ·	:	· ,
PercentSolids:	0		Station ID:				· · · · · · · · · · · · · · · · · · ·	

### CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE	Concentration	С	Q	М	MDL	RL
47752-0-60-0	Alkalinity (Total)	220	1		IS	10	20
7664-41-7	Ammonia	0.197	J	0-2	AS	0.02	0.25
1-00-3	Chloride	9.2	5	4-1	IC	0.34	1
7782-41-4	Fluoride	1 .	บุ	H-1	IC	0.33	1
25-90-0	Nitrate-N	0.73	7	H-1	IC	0.036	0.1
15-90-0	Nitrite-N	0.037	J	Q-2.H-	/IC	0.031	0.1
14265-44-2	ortho-Phosphate-P	1.	ŲŢ	H-1	IC	0.24	1
1-01-0	Residue, Filterable (TDS)	400	1		GR	10	10
3-03-5	Sulfate	7.9	5	H-1	IC	0.32	1
18496-25-8	Sulfide	0.2	J	4-2	T	0.08	2
1012_5	TOC	1.13			TC	0.31	1

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	92.0	90 - 115	
		A	

Color Betore:	Clarity Before:	t exture :
Color After :	Clarity After:	Artifacts:
Comments:	e e e e e e e e e e e e e e e e e e e	•

### INORGANIC ANALYSIS DATA SHEET

								10 (10.	
Lab Name:	Spectrum Anal	ytical, Inc.	Contract:	Smokey Mountain	Smelters 073-		SMSSV	V1.4	
Lab Code :	PEL	_ Case No.:	Withering and and an extra many	SAS No:		SDG No.:	3511009	* .	
Matrix: N	/ATER	to a decidade d		Lab Sample ID:	351100906	·		•	
Level:(low/me	ed) LOW			Date Received:	11/15/2013				
PercentSolids	s: <u>0</u>			Station ID:					

CONCENTRATION UNITS: MG/L

CAS NO.	ANALYTE.	Concentration	С	Q	М	MDL	RL
47752-0-60-0	Alkalinity (Total)	195			IS	2.5	5
7664-41-7	Ammonia	0.155	آ ل	4-2	AS	0.02	0.25
7782-41-4	Fluoride	0.4	J	Q-2.H	/IC	0.33	7 -
25-90-0	Nitrate-N	1.2	J	4-1	IC	0.036	0.1
15-90-0	Nitrite-N	0.1	U,7	H-1	IC	0.031	0.1
14265-44-2	ortho-Phosphate-P	1	UJ		IC	0.24	1
1-01-0	Residue, Filterable (TDS)	494			GR	10	- 10
3-03-5	Sulfate	16.6	$\mathcal{T}$	H-1	IC	0.32	1
18496-25-8	Sulfide	0.401	J	0-2	T .	0.08	2
1012_5	тос	0.771	_	42	TC	0.31	1

Surrogate	Recovery	Control Limits	Qualifier
Dichloroacetate - DCA	108.0	90 - 115	_

Color Before:	Clarity Before:	Texture :
Color After:	Clarity After:	Artifacts:
Comments:		

#### U.S. EPALCIE

INORGANIC ANALYSIS DATA SHEET

	-				*		EPA S	ample No.		
Lab Name:	Spectrum Analy	tical, Inc.	Contract:	Smokey Mountain	Smelters 073-	_	SMS	SW14DL1		
Lab Code :	PEL	Case No.:	THE METALON OF STREET	SAS No:	24 p. 41 - 11 - 17 - 17 - 18 - 18 - 18 - 18 - 1	SDG No.	: 351100	9	·	
Matrix: W	ATER			Lab Sample ID:	351100906DL	_1				
Level:(low/me	d) LOW	<del>.</del>	•	Date Received:	11/15/2013	· · · · · · · · · · · · · · · · · · ·				
PercentSolids	: <u>0</u>		•	Station ID:		·				
	•									
		•	•		*.					
CONCENTRA	ATION UNITS:	MG/L	· · · · ·	·						
CAS NO.	ANALYTE			Concentration	С	۵	М	•	MDL	RL
1-00-3	Chloride			128	15	H-1	IC		3.4	10

1 .	Surrogate		Recovery	Control Limits	Qualifier
Dichloroac	etate - DCA		90.8	90 - 115	
	•				
olor Before: _	ing the self-days.	Clarity Before	re:	Texture :	
olor After:	111111111111	Clarity After	r:	Artifacts:	<u> </u>

Ms. Denise Goddard United States Environmental Protection Agency Science and Ecosystem Support Division 980 College Station Road Athens, GA 30605-2720

Subject: Data Review and Validation

Site Name: Smokey Mountain Smelters, Knoxville, TN

Project No.: DG-0818

ELEMENT Sample ID. Nos: NA

Inorganic Analysis: TestAmerica, Savannah, GA

Date(s) Sampled: 3/4/14 - 3/5/14

VTSR Date: 3/6/14 Date Received from Lab: TDF No.: 14T0812

Dear Ms. Goddard:

The ESAT Work Team has reviewed the above-captioned data package consisting of adequate deliverables to document EPA Methods 2320B for alkalinity; E350.1 for ammonia; E300.1 for fluoride, chloride, sulfate, nitrate and nitrite; E365.1 for ortho-phosphate; 5310B for total organic carbon (TOC); 2540C for total dissolved solids (TDS); 7196A for hexavalent chromium; and 4500 for sulfide for 21 water samples according to EPA guidelines. This package presents acceptable technical performance and generally met the standard for quality required by Region 4 except as detailed below.

Examination of laboratory blank samples revealed apparent low-level contamination with ammonia, hexavalent chromium, and orthophosphate. Reported detection limits were adjusted as high as ten times the blank levels to discount possible false positives due to contamination in the method blanks.

Holding times were missed for ortho-phosphate for almost all samples and for nitrate/nitrite and chromium in select samples. See the Data Qualifiers Summary for additional details. These results were "J" qualified (H-1 or H-6).

Matrix spike recovery was high for ammonia in sample SMSSW08 SPRING. The positive ammonia result for this sample was considered estimated and "J" qualified (QM-2).

A Stage 4 validation consisting of manual review was performed on the inorganic samples submitted for this case.

Further details are provided in the attached review summary form. Please feel free to contact this office if we can be of further service.

Very truly yours,

Sue Jones Chemist Alion Science and Technology ESAT Contractor, Region 4 EPA

#### **Inorganic Data Quality Assessment Record (DQAR)**

Review Date:	8/21/14	Analyses:	NO3, NO2, o-PO4, SO4, F, Cl, NH3, Alk., TDS, TOC, Sulfide, Cr ⁺⁶	Matrix:	Water	Project #:	DG-0818	
SDG/L	Lab File: 680-99116 & 680-99170						_	
Labor	ratory			TestAme	rica, Savannah, GA			
Site N	Name:	Smokey Mountain Smelters, Knoxville, TN						
Check One: EPA ESAT CLP Other (specify)		Non-CLF	(RAS)					

Signatures: SJ

Reviewer Review Codes: M- Metals, O- Others

Sample Numbers:

Water:		Soil/Sediment:	
SMSMW12B	SMSSW04		
SMSMW07A	SMSSW12		
SMSMW13B	SMSMW08A		
SMSSW20	SMSMW03B		
SMSMW11A	SMSMW02A		
SMSMW07B	SMSMW12A		
SMSSW02	SMSSW03		
SMSSW10	SMSMW04A		
SMSMW11B	SMSMW01A		
SMSMW13A			
SMSSW08			
SMSSW08 SPRING			

#### I. SUMMARY OF PROBLEMS AND COMMENTS:

A summary of deficiencies noted for the methods used to generate data for this project is presented below. Please refer to the Data Quality Assessment Record (DQAR) for each data file and the data flag summary table at the end of this review document. For the purposes of this review, the QC limits specified in the analytical method have been applied to the data. Data qualifier recommendations are made in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (Functional Guidelines), and the Region 4 SOP, Data Validation Standard Operating Procedures for Contract Laboratory Program Routine Analytical Services (R4DVSOP).

#### **Data Review Comments:**

	II. Data Quality Assessment (An explanation for any "no" answer must be provided)			
1.	Summary	Yes	N/A	No
	Were all requested analyses performed?	O, M		
	Were all required QC checks performed?	O, M		
	Were all required documents present?	O, M		
	Were requested detection limits met?	?		
Rem	ark: Project required detection limits are unknown.			•
2.	Holding Times:(Holding times are not applicable for non-aqueous samples)	Yes	N/A	No
	Were water samples properly preserved?	O, M		
	Were water holding time requirements met?	O, M		O, M

	Remark: Holding times were missed for o-phosphate, chromium, and nitrate/nitrite. Affect	ted samples w	ere "J" quali	fied.
3.	Calibrations:	Yes	N/A	No
	A. Initial Calibration:			
	Were acceptable correlation coefficients obtained?	O, M		
	Were acceptable % Recoveries for analytes obtained?	O, M		
	B. Continuing Calibration			
	Were acceptable % Recoveries for analytes obtained?	O, M		
	Remark: Evaluation was performed according to the laboratory calibration limits for these of the +- 10% customarily used for metals evaluation.	non-CLP ana	lytes which a	re outside
	of the +- 10% customarny used for metals evaluation.			
4.	Blanks:	Yes	N/A	No
7.	Were any contaminants noted in the blanks?	O, M		0
	If yes, were blank rules applied to the data?	0, M		0
	Remark: 10X rule applied	<b>0, M</b>		
	- v · · · · · · · · · · · · · · · · · ·			
5.	ICP Interference Check Sample:	Yes	N/A	No
J.	Were results within 20% of the true value?		O, M	
	Were False positives Reported?		0, M	
	Were False negatives reported?		0, M	
	Remark:		0,111	<u> </u>
6.	Matrix spikes:	Yes	N/A	No
	Was a matrix spike analysis performed?	O, M		0
	Were samples spiked at appropriate levels?	0, M		0
	Were matrix spike/matrix spike duplicate analyses performed?	O, M		0
	Were acceptable recoveries obtained?	O, M		0
	Was acceptable precision obtained?	O, M		0
	Remark: MS/MSD was performed for all analytes except alkalinity, TDS, and sulfide. For		ls, LCS/LCSI	D
	recoveries and RPDs were used for accuracy and precision information.			
7.	Matrix duplicate analysis:	Yes	N/A	No
	Was a matrix duplicate analysis performed?	0		M
	Was duplicate precision in control?	0		M
	Remark: Duplicate was performed for alkalinity and sulfide.			
		1		ı
8.	Performance Evaluation Sample (PES):	Yes	N/A	No
	Was a P.E.S. analyzed with the samples?			O, M
	If yes, were acceptable results obtained?			
	Remark:			
		T ==	<b>.</b>	T
9.	Method Standard / Laboratory Control Sample:	Yes	N/A	No
	Were acceptable recoveries obtained?	O, M		
	Was acceptable precision obtained?	O, M		
	Remark:			

10.	ICP Serial Dilution Sample:	Yes	N/A	No
	Was ICP serial dilution analysis performed?			O, M
	Were diluted results within 10% of undiluted sample result?		O, M	
	Remark:			
11.	Completeness:	Yes	N/A	No
	Were all requested analyses performed?	O, M		
	Were all required documents present? If yes, were results provided?	O, M		
	Were results of calculation checks acceptable?	O, M		
	Remark:	, , ,		•

## **Additional Comments:**

## III. Data Qualifiers Summary

Based on a review of the quality control information, the following is a table summarizing the data qualifiers used by Region 4 for this data review report.

	Recommended Data Qualifiers							
Case	NA	Project Number:	DG-0818		NT Sample Nos.	NA		
Site	Smokey Mo	ountain Smelters, Kn	oxville, TN	D	ate:	8/21/2014		
A CC a 4 a d C a manula a		Amalastas	Decommended	O alifi aa	T	Dagger		
Affected Samples		Analytes	Recommended	Quanners		Reason		
SMSSW08 SPRING		Ammonia	J, QM-2		Matrix spi	ke recovery above nits		
SMSMW12B, SMSSW10	, SMSMW04A	Fluoride	J, Q-2		Concentra	tion <rl and="">MDL</rl>		
SMSMW11B, SMSMW13A, SMSMW07A, SMSMW13B, SMSSW20, SMSMW11A, SMSMW07B, SMSSW10, SMSSW02, SMSSW08, SMSSW08 SPRING		o-PO ⁴	J, H-1		Holding time missed			
SMSMW13A, SMSMW12 SMSSW12	2B, SMSSW08, SMSSW04,	TOC	J, Q-2		Concentra	tion <rl and="">MDL</rl>		
SMSMW13A, SMSMW12 SMSSW08, SMSSW04	2B, SMSSW20, SMSSW10,	Ammonia	U, B-4		Sample res	sult >RL but <10X e		
SMSMW11B, SMSMW13	3A, SMSMW12A	Cr	J, H-1		Holding ti	me missed		
SMSMW12A		Cr	J, Q-2			tion <rl and="">MDL</rl>		
SMSMW07A, SMSMW03	3B	NO ³	J, H-6		Dilution of holding	r reanalysis ran out time		
SMSMW03B		NO ²	J, H-6	J, H-6		Dilution or reanalysis ran out of holding time		
SMSMW07A, SMSSW20 SMSSW12	, SMSSW08, SMSSW04,	o-PO ⁴	J, Q-2			tion <rl and="">MDL</rl>		
SMSSW02, SMSSW08 SI SMSMW12A	PRING, SMSMW08A,	NO ²	J, Q-2		Concentra	tion <rl and="">MDL</rl>		

				1	TIME T	RACKE	R							
					VERS	SION 4.1								
CASE #:	NA		P	ROJECT	Γ#:	DO	G-08	318	TDF	NO:		14T	0812	
LAB M	ETHOD(S):		EPA	SOW		LIMS	ME	THOD CO	DE(S):		-	1100		
NUMBER	OF SAMPLES:	21			TED TIME ECEIPT (V			3/6/14	DUE I	DATE:	E: 8/28/14		/14	
SITE NAME	:	Smo	key M	ountain	Smelters	, Knoxville	e, Tl	N		SI	ΓE ID:	A	4MD	
PROGRAM:	SARA		TA	ASK ORD 4	DER:	Wor	k O	rder:				Box 14	-065	
ST	AGE OR PERSON			INITIAL	S	DATE	ACC	EPTED	COMPLE	TION D	ATE	# Hours		
1. Receive	ed by EPA QAS													
2. Eviden	tiary Audit													
3. Data R	eviewer/Spreadsheet Data	Entry		SKJ		8/	14/	14	8/2	21/14		1	4	
	ary Review/Spreadsheet ation (memo, entry, conte	nt)												
5. Elemen	t Import													
6. Task M (Overv	onitor riew /data distribution)													
Sample and Mo	ethod Information													
	eparated by methods for c	ases with	V	SV	Pest./	PCDD/		Meta	als	CN		OTHERS (spe		
multipl	e lab methods applied)				PCBs	PCDF		ICP/AES	ICP/MS		NO3 Cl, I	, NO2, o-PO NH3, Alk., T Sulfide, O	DS, TOC,	
												21		
												_		
Notes/Comm	ents:				1				·	•	1			

May 21, 2014

Ms. Denise Goddard United States Environmental Protection Agency Science and Ecosystem Support Division 980 College Station Road Athens, GA 30605-2720

Subject: Data Review and Validation

Site Name: Smokey Mountain Smelters, Knoxville, TN

Project No.: DG-0520

ELEMENT Sample ID. Nos: NA

Inorganic Analysis: TestAmerica, Savannah, GA

Date(s) Sampled: 3/3/14 VTSR Date: 3/5/14 Date Received from Lab: TDF No.: 14T0547

Dear Ms. Goddard:

The ESAT Work Team has reviewed the above-captioned data package consisting of adequate deliverables to document EPA Methods 2320B for alkalinity; E350.1 for ammonia; E300.1 for fluoride, chloride, sulfate, nitrate and nitrite; E365.1 for ortho-phosphate; 5310B for total organic carbon (TOC); 2540C for total dissolved solids (TDS); and 4500 for sulfide for eight water samples according to EPA guidelines. This package presents acceptable technical performance and generally met the standard for quality required by Region 4 except as detailed below.

Examination of laboratory blank samples revealed apparent low-level contamination with ammonia and ortho-phosphate. Reported detection limits were adjusted as high as ten times the blank levels to discount possible false positives due to contamination in the method blanks.

Holding times were missed for ortho-phosphate for all samples and for nitrate/nitrite for SMSSW10 and SMSSW09. These results were "J" qualified (H-1).

A Stage 4 validation consisting of manual review was performed on the inorganic samples submitted for this case.

Further details are provided in the attached review summary form. Please feel free to contact this office if we can be of further service,

Very truly yours,

Sur Jon Es

Sue Jones Chemist

Alion Science and Technology

ESAT Contractor, Region 4 EPA

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#### Inorganic Data Quality Assessment Record (DQAR)

Review Date:	5/21/14	Analyses:	NO3, NO2, o-PO4, SO4, F, Cl, NH3, Alk., TDS, TOC, Sulfide	Matrix:	Water	Project #:	DG-0520
SDG /L	ab File:		680-	99111			
Labor	ratory			TestAmer	ica, Savannah, GA		,
Site Name: Smokey Mountain Smelters, Knoxville, TN							
Check	One:	EPA	ESAT	CLP	Other (specify)	Non-CLP	(RAS)

Signatures: SJ

Reviewer

Review Codes: M- Metals, H- Mercury, C- Cyanide, O- Others

Sample Numbers:						
Water:			Soil/Sediment:			
SMSSW01						
SMSMW10A						
SMSMW10B			_			
SMSSW11						
SMSSW14	·					
SMSSW13						
SMSSW09SPRING						
SMSSW09						
1			·			

#### I. SUMMARY OF PROBLEMS AND COMMENTS:

A summary of deficiencies noted for the methods used to generate data for this project is presented below. Please refer to the Data Quality Assessment Record (DQAR) for each data file and the data flag summary table at the end of this review document. For the purposes of this review, the QC limits specified in the analytical method have been applied to the data. Data qualifier recommendations are made in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (Functional Guidelines), and the Region 4 SOP, Data Validation Standard Operating Procedures for Contract Laboratory Program Routine Analytical Services (R4DVSOP).

**Data Review Comments:** 

	II. Data Quality Assessment (An explanation for any "no" answer must be provided)			
1.	Summary	Yes	N/A	No
	Were all requested analyses performed?	0		
	Were all required QC checks performed?	0		
	Were all required documents present?	0		
	Were requested detection limits met?	?		
Ren	ark: Project required detection limits are unknown.			· · ·
2.	Holding Times:(Holding times are not applicable for non-aqueous samples)	Yes	N/A	No
	Were water samples properly preserved?	0		
	Were water holding time requirements met?	0		O

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	Remark: Holding times were missed for o-phosphate and nitrate/nitrite. Affected samples	were "J" qua	lified.	
3.	Calibrations:	Yes	N/A	No
	A. Initial Calibration:			
	Were acceptable correlation coefficients obtained?	0		
	Were acceptable % Recoveries for analytes obtained?	0		
	B. Continuing Calibration			
	Were acceptable % Recoveries for analytes obtained?	0		
	Remark: Evaluation was performed according to the laboratory calibration limits for these	non-CLP ana	lytes which a	re outside
	of the +- 10% customarily used for metals evaluation.			<u> </u>
		T		
4.	Blanks:	Yes	N/A	No
	Were any contaminants noted in the blanks?	0		0
	If yes, were blank rules applied to the data?	0		<u> </u>
	Remark: 10X rule applied			
5.	ICP Interference Check Sample:	Yes	N/A	No.
	Were results within 20% of the true value?		0	
	Were False positives Reported?		0	·
	Were False negatives reported?		0	
	Remark:			
6.	Matrix spikes:	Yes	N/A	No
	Was a matrix spike analysis performed?	0		О
	Were samples spiked at appropriate levels?	0		0
	Were matrix spike/matrix spike duplicate analyses performed?	0		О
	Were acceptable recoveries obtained?	0		0
	Was acceptable precision obtained?	0		0
	Remark: MS/MSD was only performed for method 300.1. For all other methods, LCS/LC	SD recoveries	and RPDs w	ere used
	for accuracy and precision information.			
	· · · · · · · · · · · · · · · · · · ·			
7.	Matrix duplicate analysis:	Yes	N/A	No
	Was a matrix duplicate analysis performed?	0		
	Was duplicate precision in control?	0		
	Remark:			
8.	Performance Evaluation Sample (PES):	Yes	N/A	No
	Was a P.E.S. analyzed with the samples?			0
	If yes, were acceptable results obtained?			
	Remark:			
9.	Method Standard / Laboratory Control Sample:	Yes	N/A	No
	Were acceptable recoveries obtained?	0		
	Was acceptable precision obtained?	0	-	
	Remark:			

10.	ICP Serial Dilution Sample:	Yes	N/A	No
	Was ICP serial dilution analysis performed?		<del> </del>	O
	Were diluted results within 10% of undiluted sample result?		0	
	Remark:			
				•
11.	Completeness:	Yes	N/A	No
	Were all requested analyses performed?	0		
	Were all required documents present? If yes, were results provided?	0		
	Were results of calculation checks acceptable?	0		
	Remark:			
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## **Additional Comments:**

## III. Data Qualifiers Summary

Based on a review of the quality control information, the following is a table summarizing the data qualifiers used by Region 4 for this data review report.

		Recommended	Data Qualifiers				
Case	NA	Project Number:	DG-0520	1	NT Sample Nos.	NA	
Site	Smokey M	ountain Smelters, Kn	oxville, TN	D	ate:	5/21/2014	
Affected Samples		Analytes	Recommended	Qualifiers		Reason	
SMSSW01, SMSSW09		NO3/NO2	J, H-1		Holding time missed		
SMSSW01, SMSSW11, SI	MSSW09SPRING,	Fluoride	J, Q-2	Q-2 Concentration <r< td=""></r<>			
SMSSW01, SMSMW10A, SMSSW14, SMSSW13, SI SMSSW09	SMSMW10B, SMSSW11, MSSW09SPRING,	o-PO4	J, H-1		Holding time missed		
SMSSW09SPRING	,	TOC	J, Q-2		Concentrat	ion <rl and="">MDL</rl>	
SMSSW01, SMSMW10A, SMSMW10B, SMSSW11, SMSSW14, SMSSW13, SMSSW09SPRING, SMSSW09		Ammonia	U, B-4		Sample res	ult <10X blank	
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# FORM I HPLC/IC ORGANICS ANALYSIS DATA SHEET

Job No.: 680-99111-1

 SDG No.: 68099111-1

 Client Sample ID: SMSSW01
 Lab Sample ID: 680-99111-1

 Matrix: Water
 Lab File ID: 0314142037-17.d

 Analysis Method: 300.0
 Date Collected: 03/03/2014 11:17

 Extraction Method:
 Date Extracted:

 Sample wt/vol: 1(mL)
 Date Analyzed: 03/14/2014 20:37

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Lab Name: TestAmerica Savannah

Analysis Batch No.: 319822

Injection Volume: 25(uL) GC Column: Dionex AS18 ID: 4(mm)

% Moisture: GPC Cleanup:(Y/N) N

CAS NO. COMPOUND NAME RESULT Q RL MDL

Units: mg/L

14808-79-8 4.9 0.50 Sulfate 0.25 16984-48-8 Fluoride 0.057 0.10 0.025 J, 4-2 16887-00-6 Chloride 1.9 0.50 0.25

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# FORM I HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Savannah Job No.: 680-99111-1 SDG No.: 68099111-1 Client Sample ID: SMSMW10A Lab Sample ID: 680-99111-2 Matrix: Water Lab File ID: 0316141417-17.d Analysis Method: 300.0 Date Collected: 03/03/2014 14:30 Extraction Method: Date Extracted: Sample wt/vol: .1(mL) Date Analyzed: 03/16/2014 14:17 Con. Extract Vol.: 1(mL) Dilution Factor: 50 Injection Volume: 25(uL) GC Column: Dionex AS18 ID: 4 (mm) % Moisture: GPC Cleanup: (Y/N) N Analysis Batch No.: 319850 Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
14808-79-8	Sulfate	1700		. 25	13
16984-48-8	Fluoride	73	<del></del>	5.0	1.3
16887-00-6	Chloride	850		25	13

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# FORM I HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Savannah Job No.: 680-99111-1 SDG No.: 68099111-1 Client Sample ID: SMSMW10B Lab Sample ID: 680-99111-3 Matrix: Water Lab File ID: 0314142138-21.d Analysis Method: 300.0 Date Collected: 03/03/2014 14:50 Extraction Method: Date Extracted: Date Analyzed: 03/14/2014 21:38 Sample wt/vol: 1(mL) Con. Extract Vol.: 1(mL) Dilution Factor: 4 GC Column: Dionex AS18 ID: 4 (mm) Injection Volume: 25(uL) GPC Cleanup: (Y/N) N % Moisture: Analysis Batch No.: 319822 Units: mg/L

CAS NO.		COMPOUND NAME	RESULT	Q	RL	MDL
16984-48-8	Fluoride		9.0		0.40	0.10
16887-00-6	Chloride		66		2.0	1.0

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# FORM I HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Savannah Job No.: 680-99111-1 SDG No.: 68099111-1 Client Sample ID: SMSMW10B Lab Sample ID: 680-99111-3 Matrix: Water Lab File ID: 0316141433-18.d Analysis Method: 300.0 Date Collected: 03/03/2014 14:50 Extraction Method: Date Extracted: Sample wt/vol: 1(mL) Date Analyzed: 03/16/2014 14:33 Con. Extract Vol.: 1(mL) Dilution Factor: 25 GC Column: Dionex AS18 ID: 4 (mm) Injection Volume: 25(uL) % Moisture: GPC Cleanup; (Y/N) N Analysis Batch No.: 319850 Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
14808-79-8		600		13	6.3

# FORM I HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Savannah Job No.: 680-99111-1

SDG No.: 68099111-1

Client Sample ID: SMSSW11 Lab Sample ID: 680-99111-4

Matrix: Water Lab File ID: 0314142153-22.d

Analysis Method: 300.0 Date Collected: 03/03/2014 13:20

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 03/14/2014 21:53

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 25(uL) GC Column: Dionex AS18 ID: 4(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 319822 Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	· Q	RL	MDL
14808-79-8	Sulfate	9.3		0.50	0.25
16984-48-8	Fluoride	0.081	J, Q-2	0.10	0.025
16887-00-6	Chloride	5.6		0.50	0.25

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# FORM I HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Savannah	Job No.: 680-99111-1
SDG No.: 68099111-1	
Client Sample ID: SMSSW14	Lab Sample ID: 680-99111-5
Matrix: Water	Lab File ID: 0314142239-25.d
Analysis Method: 300.0	Date Collected: 03/03/2014 14:15
Extraction Method:	Date Extracted:
Sample wt/vol: 1(mL)	Date Analyzed: 03/14/2014 22:39
Con. Extract Vol.: 1(mL)	Dilution Factor: 1
Injection Volume: 25(uL)	GC Column: Dionex AS18 ID: 4 (mm)
% Moisture:	GPC Cleanup:(Y/N) N
Analysis Batch No.: 319822	Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
14808-79~8	Sulfate	14		050	0.25
16984-48-8	Fluoride	0.51		0.10	0.025

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Lab Name: TestA	merica Savannah	Job No.: 680-99111-1			
SDG No.: 680991	11-1				
Client Sample ID	: SMSSW14	Lab Sample ID: 680-99111-5			
Matrix: Water		Lab File ID: 0316141448-19.d			
Analysis Method:	300.0	Date Collected: 03/03/2014 14:15			
Extraction Metho	Method: Date Extracted:				
Sample wt/vol:	1 (mL)	Date Analyzed: 03/16/2014 14:48			
Con. Extract Vol	.; 1(mL)	Dilution Factor: 2			
Injection Volume	25(uL)	GC Column: Dionex AS18 ID: 4 (mm)			
% Moisture:	-	GPC Cleanup:(Y/N) N			
Analysis Batch N	0.: 319850	Units: mg/L			
CAS NO.	COMPOUND NAME	RESULT Q RL MDL			
16887-00-6 C	nloride	51 1.0 0.50			

1.0

0.50

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Lab Name: TestAmerica Savannah Job No.: 680-99111-1 SDG No.: 68099111-1 Client Sample ID: SMSSW13 Lab Sample ID: 680-99111-6 Matrix: Water Lab File ID: 0314142255-26.d Analysis Method: 300.0 Date Collected: 03/03/2014 14:50 Extraction Method: Date Extracted: Sample wt/vol: 1(mL) Date Analyzed: 03/14/2014 22:55 Con. Extract Vol.: 1(mL) Dilution Factor: 1 Injection Volume: 25(uL) GC Column: Dionex AS18 ID: 4(mm) % Moisture: GPC Cleanup:(Y/N) N Analysis Batch No.: 319822 Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
14808-79-8	Sulfate	17		0.50	0.25
16984-48-8	Fluoride	0.71		0.10	0.025

Lab Name: TestAmerica Savannah Job No.: 680-99111-1 SDG No.: 68099111-1 Client Sample ID: SMSSW13 Lab Sample ID: 680-99111-6 Matrix: Water Lab File ID: 0316141503-20.d Analysis Method: 300.0 Date Collected: 03/03/2014 14:50 Extraction Method: Date Extracted: Sample wt/vol: 1(mL) Date Analyzed: 03/16/2014 15:03 Con. Extract Vol.: 1(mL) Dilution Factor: 4 Injection Volume: 25(uL) GC Column: Dionex AS18 ID: 4 (mm) % Moisture: GPC Cleanup: (Y/N) N Analysis Batch No.: 319850 Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
16887-00-6	Chloride	71		2.0	1.0

. 

Lab Name: TestAmerica Savannah	Job No.: 680-99111-1				
SDG No.: 68099111-1					
Client Sample ID: SMSSW09 SPRING	Lab Sample ID: 680-99111-7				
Matrix: Water	Lab File ID: 0314142340-29.d				
Analysis Method: 300.0	Date Collected: 03/03/2014 15:45				
Extraction Method:	Date Extracted:				
Sample wt/vol: 1(mL)	Date Analyzed: 03/14/2014 23:40				
Con. Extract Vol.: 1(mL)	Dilution Factor: 1				
Injection Volume: 25(uL)	GC Column: Dionex AS18 ID: 4 (mm)				
% Moisture:	GPC Cleanup:(Y/N) N				
Analysis Batch No.: 319822	Units: mg/L				
CAS NO. COMPOUND NAME	RESULT Q RL MDL				

14808-79-8

16984-48-8

Sulfate

Fluoride

0.50

0.10

15

0.097

0.25

0.025

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Lab Name: TestAr	merica Savannah	Job No.: 680-99111-1				
SDG No.: 680991	1-1					
Client Sample ID	: SMSSW09 SPRING	Lab Sample ID: 680-99111-7				
Matrix: Water		Lab File ID: 0316141549-23.d				
Analysis Method:	300.0	Date Collected: 03/03/2014 15:45				
Extraction Metho	d:	Date Extracted:				
Sample wt/vol:	1 (mL)	Date Analyzed: 03/16/2014 15:49				
Con. Extract Vol	.: 1(mL)	Dilution Factor: 2				
Injection Volume	: 25(uL)	GC Column: Dionex AS18 ID: 4 (mm)				
% Moisture:		GPC Cleanup: (Y/N) N				
Analysis Batch No	o.: <u>319850</u>	Units: mg/L				
CAS NO.	COMPOUND NAME	RESULT Q RL MDL				

Chloride

16887-00-6

Lab Name: TestAmerica Savannah Job No.: 680-99111-1 SDG No.: 68099111-1 Client Sample ID: SMSSW09 Lab Sample ID: .680-99111-8 Matrix: Water Lab File ID: 0314142356-30.d Analysis Method: 300.0 Date Collected: 03/03/2014 10:10 Extraction Method: Date Extracted: Sample wt/vol: 1(mL) Date Analyzed: 03/14/2014 23:56 Con. Extract Vol.: 1(mL) Dilution Factor: 1 GC Column: Dionex AS18 ID: 4 (mm) Injection Volume: 25(uL) % Moisture: GPC Cleanup: (Y/N) N Analysis Batch No.: 319822 Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL _.	MDL
14808-79-8	Sulfate	18		0.50	0.25
16984-48-8	Fluoride	0.86		0.10	0.025

Lab Name: TestAmerica Savannah Job No.: 680-99111-1 SDG No.: 68099111-1 Client Sample ID: SMSSW09 Lab Sample ID: 680-99111-8 Matrix: Water Lab File ID: 0316141605-24.d Analysis Method: 300.0 Date Collected: 03/03/2014 10:10 Extraction Method: Date Extracted: Sample wt/vol: 1(mL) Date Analyzed: 03/16/2014 16:05 Con. Extract Vol.: 1(mL) Dilution Factor: 4 Injection Volume: 25(uL) GC Column: Dionex AS18 · ID: 4 (mm) % Moisture: GPC Cleanup: (Y/N) N Analysis Batch No.: 319850 Units: mg/L CAS NO. COMPOUND NAME RESULT RLMDL

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16887-00-6

Chloride

1.0

2.0

Lab Name: TestAmerica Savannah Job No.: 680-99111-1 SDG No.: 68099111-1 Client Sample ID: SMSSW01 Lab Sample ID: 680-99111-1 Matrix: Water Lab File ID: 0305142246-48.d Analysis Method: 300.0 Date Collected: 03/03/2014 11:17 Extraction Method: Date Extracted: Sample wt/vol: 5(mL) Date Analyzed: 03/05/2014 22:46 Con. Extract Vol.: 5(mL) Dilution Factor: 2 Injection Volume: 25(uL) ID: 4 (mm) GC Column: AS18 % Moisture: GPC Cleanup: (Y/N) N Analysis Batch No.: 318426 Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL00673	Nitrite as NO2	<0.16	H-1, JU		0.16
STL00672	Nitrate as NO3	1.2	H-/, T	0.44	0.22

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Lab Name: TestAmerica Savannah Job No.: 680-99111-1 SDG No.: 68099111-1 Client Sample ID: SMSMW10A Lab Sample ID: 680-99111-2 Matrix: Water Lab File ID: 0305141332-12.d Date Collected: 03/03/2014 14:30 Analysis Method: 300.0 Extraction Method: Date Extracted: Sample wt/vol: 5(mL) Date Analyzed: 03/05/2014 13:32 Con. Extract Vol.: 5(mL) Dilution Factor: 4 Injection Volume: 25(uL) GC Column: AS18 ID: 4 (mm) % Moisture: GPC Cleanup: (Y/N) N Analysis Batch No.: 318425 Units: mg/L CAS NO. COMPOUND NAME RESULT MDL Q RL

<0.33

STL00673

Nitrite as NO2

Lab Name: TestAmerica Savannah	Job No.: 680-99111-1		
SDG No.: 68099111-1			
Client Sample ID: SMSMW10A	Lab Sample ID: 680-99111-2		
Matrix: Water	Lab File ID: 0305141316-11.d		
Analysis Method: 300.0	Date Collected: 03/03/2014 14:30		
Extraction Method:	Date Extracted:		
Sample wt/vol: 5(mL)	Date Analyzed: 03/05/2014 13:16		
Con. Extract Vol.: 5(mL)	Dilution Factor: 40		
Injection Volume: 25(uL)	GC Column: AS18 ID: 4 (mm)		
% Moisture:	GPC Cleanup: (Y/N) N		
Analysis Batch No.: 318425	Units: mg/L		
CAS NO COMPOUND NAME	RESILT O RI MDI.		

STL00672

Nitrate as NO3

8.8

Lab Name: TestAmerica Savannah Job No.: 680-99111-1

SDG No.: 68099111-1

Client Sample ID: SMSMW10B Lab Sample ID: 680-99111-3

Matrix: Water Lab File ID: 0305141347-13.d

Analysis Method: 300.0 Date Collected: 03/03/2014 14:50

Extraction Method: Date Extracted:

Sample wt/vol: 5(mL) Date Analyzed: 03/05/2014 13:47

Con. Extract Vol.: 5 (mL) Dilution Factor: 2

Injection Volume: 25(uL) GC Column: AS18 ID: 4(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 318425 Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL00673	Nitrite as NO2	<0.16	и	0.34	0.16
STL00672	Nitrate as NO3	11		0.44	0.22

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Lab Name: TestAmerica Savannah	Job No.: 680-99111-1
SDG No.: 68099111-1	
Client Sample ID: SMSSW11	Lab Sample ID: 680-99111-4
Matrix: Water	Lab File ID: 0305141245-9.d
Analysis Method: 300.0	Date Collected: 03/03/2014 13:20
Extraction Method:	Date Extracted:
Sample wt/vol: 5(mL)	Date Analyzed: 03/05/2014 12:45
Con. Extract Vol.: 5(mL)	Dilution Factor: 2
njection Volume: 25(uL)	GC Column: AS18 ID: 4 (mm)
Moisture:	GPC Cleanup:(Y/N) N
Analysis Batch No.: 318425	Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	· RL	MDL
STL00673	Nitrite as NO2	<0.16	U.	0.34	0.16
STL00672	Nitrate as NO3	4.0		0.44	0.22

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Lab Name: TestAmerica Savannah Job No.: 680-99111-1 SDG No.: 68099111-1 Client Sample ID: SMSSW14 Lab Sample ID: 680-99111-5 Matrix: Water Lab File ID: 0305141301-10.d Analysis Method: 300.0 Date Collected: 03/03/2014 14:15 Extraction Method: Date Extracted: Sample wt/vol: 5(mL) Date Analyzed: 03/05/2014 13:01 Con. Extract Vol.: 5(mL) Dilution Factor: 2 Injection Volume: 25(uL) GC Column: AS18 · ID: 4 (mm) % Moisture: GPC Cleanup: (Y/N) N Units: mg/L Analysis Batch No.: 318425

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL00673	Nitrite as NO2	<0.16	U	0.34	0.16
STL00672	Nitrate as NO3	3.8		0.44	0.22

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Lab Name: TestAmerica Savannah Job No.: 680-99111-1 SDG No.: 68099111-1 Client Sample ID: SMSSW13 Lab Sample ID: 680-99111-6 Matrix: Water Lab File ID: 0305141402-14.d Analysis Method: 300.0 Date Collected: 03/03/2014 14:50 Extraction Method: Date Extracted: Sample wt/vol: 5(mL) Date Analyzed: 03/05/2014 14:02 Con. Extract Vol.: 5(mL) Dilution Factor: 2 Injection Volume: 25(uL) GC Column: AS18 ID: 4 (mm) % Moisture: GPC Cleanup: (Y/N) N Analysis Batch No.: 318425 Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL00673	Nitrite as NO2	<0.16	U	0.34	0.16
STL00672	Nitrate as NO3	4.0		0.44	0.22

Lab Name: TestAmerica Savannah	Job No.: 680-99111-1						
SDG No.: 68099111-1	·						
Client Sample ID: SMSSW09 SPRING	Lab Sample ID: 680-99111-7						
Matrix: Water	Lab File ID: 0305141418-15.d						
Analysis Method: 300.0	Date Collected: 03/03/2014 15:45						
Extraction Method:	Date Extracted:						
Sample wt/vol: 5(mL) Date Analyzed: 03/05/2014 14:18							
Con. Extract Vol.: 5(mL)	Dilution Factor: 2						
Injection Volume: 25(uL)	GC Column: AS18 ID: 4 (mm)						
% Moisture:	GPC Cleanup:(Y/N) N						
Analysis Batch No.: 318425 Units: mg/L							
CAS NO. COMPOUND NAME	RESULT Q RL MDL						

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STL00673	Nitrite as NO2	<0.16	U	0.34	0.16
STL00672	Nitrate as NO3	3.6		0.44	0.22
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Lab Name: TestAmerica Savannah	Job No.: 680-99111-1
SDG No.: 68099111-1	
Client Sample ID: SMSSW09	Lab Sample ID: 680-99111-8
Matrix: Water	Lab File ID: 0305142302-49.d
Analysis Method: 300.0	Date Collected: 03/03/2014 10:10
Extraction Method:	Date Extracted:
Sample wt/vol: 5(mL)	Date Analyzed: 03/05/2014 23:02
Con. Extract Vol.: 5(mL)	Dilution Factor: 2
Injection Volume: 25(uL)	GC Column: AS18 ID: 4 (mm)
% Moisture:	GPC Cleanup: (Y/N) N
Analysis Batch No.: 318426	Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL00673	Nitrite as NO2	<0.16	H-1,UJ	0.34	0.16
STL00672	Nitrate as NO3	4.6	H-/ J	0.44	0.22

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# 1B-IN INORGANIC ANALYSIS DATA SHEET GENERAL CHEMISTRY

Client Sample ID: SMSSW01 Lab Sample ID: 680-99111-1

Lab Name: TestAmerica Savannah Job No.: 630-99111-1

SDG ID.: 68099111-1

Matrix: Water Date Sampled: 03/03/2014 11:17

Reporting Basis: WET Date Received: 03/05/2014 10:15

CAS No.	Analyte	Result	RL.	MDL	Units	c	ν Ω	DIL	Method
7664-41-7	Ammonia	0.079	0.050	0.026	mg/L	u, B-4		. 1	350.1
14265-44-2	ortho-Phosphate	0.05 -0.027	0.050	0.016	mg/L	UT.	H -/	1.	365.1
7440-44-0	Total Organic Carbon	3.1	1.0	0.50	mg/L	<b> </b>		1	5310 B-2011

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#### 1B→IN INORGANIC ANALYSIS DATA SHEET GENERAL CHEMISTRY

Client Sample ID: SMSSW01

Lab Sample ID: 680-99111-1

Lab Name: TestAmerica Savannah

Job No.: 680-99111-1

SDG ID.: 68099111-1

Matrix: Water

Date Sampled:

03/03/2014 11:17

Reporting Basis: WET

Date Received: 03/05/2014 10:15

CAS No.	Analyte	Result	RL	 Units	С	Q	DIL	Method
18496-25-8	Sulfide	<1.0	1.0	mg/L	,	u	. 1	4500 S2. F-2011
100-	Alkalinity	56	5.0	 mg/L	,		1	2320B-20 11
	Total Dissolved Solids	150	5.0	mg/L			1	2540C-20 11

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Client Sample ID: SMSMW10A Lab Sample ID: 680-99111-2

Lab Name: TestAmerica Savannah Job No.: 680-99111-1

SDG TD.: 68099111-1

Matrix: Water . Date Sampled: 03/03/2014 14:30

CAS No.	Analyte	Result	RL .	MDL	Units	С	Q	DIL	Method
7664-41-7	Ammonia	0.071 -0.071	0.050	0.026	mg/L	u, B-	4	1	350.1
14265-44-2	ortho-Phosphate	0.05 -0.042	0.050	0.016	mg/L	41 ³ ,	H -/	1	365.1
7440-44-0	Total Organic Carbon	1.9	1.0	0.50	mg/L			1	5310 B-2011

Client Sample ID: SMSMW10A . Lab Sample ID: 680-99111-2

Lab Name: TestAmerica Savannah Job No.: 680-99111-1

SDG ID.: 68099111-1

Matrix: Water Date Sampled: 03/03/2014 14:30

CAS No.	Analyte	Result	RL	Units	С	Q	DIL	Method
18496-25-8	Sulfide	<1.0	1.0	mg/L	и	1	1	4500 S2 F-2011
	Alkalinity	<5.0	5.0	mg/L	U		1	2320B-20 11
	Total Dissolved Solids	4300	50	mg/L			1	2540C-20 11

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Client Sample ID: SMSMW10B Lab Sample ID: 680-99111-3

Lab Name: TestAmerica Savannah Job No.: 680-99111-1

SDG ID.: 68099111-1

Matrix: Water Date Sampled: 03/03/2014 14:50

CAS No.	Analyte	Result	, RL	MDL	Units	С	0	DIL	Method
7664-41-7	Ammonia	0.17	0.050	0.026	mg/L	U. B-4		1.	350.1
14265-44-2	ortho-Phosphate	<0.016	0.050	0.016	mg/L	uJ	H -/	1	365.1
7440-44-0	Total Organic Carbon	<0.50	1.0	0.50	mg/L	и		1	5310 B-2011

Client Sample ID: SMSMW10B

Lab Sample ID: 680-99111-3

Lab Name: TestAmerica Savannah

Job No.: 680-99111-1

SDG ID.: 68099111-1

Matrix: Water

Date Sampled:

03/03/2014 14:50

Reporting Basis: WET

Date Received: 03/05/2014 10:15

CAS No.	Analyte	Result	RL	Units	С	Q	DIL	Method
18496-25-8	Sulfide	<1.0	. 1.0	mg/L	u		1	4500 S2 F-2011
	Alkalinity	380	5.0	mg/L			1	2320B-20 11
	Total Dissolved Solids	1300	10	mg/L			1	2540C-20 11

#### 1B-IN

#### INORGANIC ANALYSIS DATA SHEET GENERAL CHEMISTRY

Client Sample ID: SMSSWl1

Lab Sample ID:

680-99111-4

Lab Name:

TestAmerica Savannah

Job No.: 680-99111-1

SDG ID.: 68099111-1

Matrix: Water

Date Sampled:

03/03/2014 13:20

Reporting Basis:

Date Received:

03/05/2014 10:15

CAS No.	Analyte	Result	RL	MDL	Units	С	Q ·	DIL	Method
7664-41-7	Ammonia	0.21	0.050	0.026	mg/L	И, В-4	7	1	350.1
14265-44-2	ortho-Phosphate	0.05 0.040	0.050	0.016	7-	LT,	#-1	1	365.1
7440-44-0	Total Organic Carbon	4.1	1.0	0.50	mg/L			1	5310 B-2011

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Client Sample ID: SMSSW11 Lab Sample ID: 680-99111-4

Lab Name: TestAmerica Savannah Job No.: 680-99111-1

SDG ID.: 68099111-1

Matrix: Water Date Sampled: 03/03/2014 13:20

CAS No.	Analyte	Result	RL	Units	С	Q	DIL	Method
18496-25-8	Sulfide	<1.0	1.0	mg/L	U		1	4500 S2 F-2011
	Alkalinity	110	5.0	mg/L			1	2320B-20 11
	Total Dissolved Solids	- 150	10	mg/L			1	2540C-20 11

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Client Sample ID: SMSSW14

Lab Sample ID: 680-99111-5

Lab Name: TestAmerica Savannah

Job No.: '680-99111-1

SDG ID.: 68099111-1

Matrix: Water

Date Sampled: 03/03/2014 14:15

Reporting Basis: WET

Date Received: 03/05/2014 10:15

CAS No.	Analyte	Result	RL	MDL	Units	С	Q ·	DIL	Method
7664-41-7	Ammonia	0.088	0.050	0.026	mg/L	U, B-4	7	1	350.1
14265-44-2	ortho-Phosphate	0.05 -0.037-	0.050	0.016	mg/L	<b>ℓ</b> ^J ,	H-/	1	365.1
7440-44-0	Total Organic Carbon	2.6	1.0	0.50	mg/L			1	5310 8-2011

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Client Sample ID: SMSSW14

Lab Sample ID: 680-99111-5

Lab Name: TestAmerica Savannah

Job No.: 680-99111-1

SDG ID.: 68099111-1

Matrix: Water

Reporting Basis: WET

Date Sampled:

03/03/2014 14:15

Date Received:

03/05/2014 10:15

CAS No.	Analyte	Result	RL	 Units	С	Q	DIL	Method
18496-25-8	Sulfide	<1.0	1.0	 mg/L	u		1	4500 S2 F-2011
	Alkalinity	120	5.0	mg/L			1	2320B-20 11
	Total Dissolved Solids	270	10	 mg/L			1	2540C-20 11

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Client Sample ID: SMSSW13

Lab Sample ID:

680-99111-6

Lab Name: TestAmerica Savannah

Job No.: 680-99111-1

SDG ID.: 68099111-1

Matrix: Water

Date Sampled:

03/03/2014 14:50

Reporting Basis: WET

Date Received:

03/05/2014 10:15

CAS No.	Analyte	Result	RL	MDL	Units	С	Q	DIL	Method
7664-41-7	Ammonia	0.11	0.050	0.026	mg/L	U.B-4	/	1	350.1
14265-44-2	ortho-Phosphate	0.05 -0.036	0.050	0.016	mg/L	UJ .	H-/	1	365.1
7440-44-0	Total Organic Carbon	2.3	1.0	0.50	mg/L			1	5310 .B-2011

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Client Sample ID: SMSSW13 Lab Sample ID: 680-99111-6

Lab Name: TestAmerica Savannah Job No.: 680-99111-1

100 No.: 000 37/17

SDG ID.: 68099111-1

Matrix: Water Date Sampled: 03/03/2014 14:50

CAS No.	Analyte	Result	RL	Units	c	Q	DIL	Method
18496-25-8	Sulfide	<1.0	1.0	mg/L	u		1	4500 S2 F-2011
	Alkalinity	120	5.0	mg/L			1	2320B-20 11
······································	Total Dissolved Solids	290	10	mg/L			1	2540C-20 11

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Client Sample ID: SMSSW09 SPRING Lab Sample ID: 680-99111-7

Lab Name: TestAmerica Savannah Job No.: 680-99111-1

SDG ID.: 68099111-1

Matrix: Water Date Sampled: 03/03/2014 15:45

Reporting Basis: WET Date Received: 03/05/2014 10:15

CAS No.	Analyte	Result	RL	MDL	Units	С	Q	DIL	Method
7664-41-7	Ammonia	0.11	0.050	0.026	mg/L	U, B-4		1	350.1
14265-44-2	ortho-Phosphace	<0.016	0.050	0.016	mg/L	UJ.	H-/	1	365.1
7440-44-0	Total Organic Carbon	0.72	1.0	0.50	mg/L	3,4-2		1	5310 B-2011

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Client Sample ID: SMSSW09

Lab Sample ID: 680-99111-8

Lab Name: TestAmerica Savannah

Job No.: 680-99111-1

SDG ID.: 68099111-1

Matrix: Water

Date Sampled: 03/03/2014 10:10

Reporting Basis: WET

Date Received: 03/05/2014 10:15

CAS No.	Analyte	Result	RL	MDL.	Units	С	Q	DIL	Method
7664-41-7	Ammonia	0.097	0.050	0.026	mg/L	U, B-2	7	1	350.1
14265-44-2	ortho-Phosphate	0.05-0-023	0.050	0.016	mg/L 💪	ŁJ,	H -/	. 1	365.1
7440-44-0	Total Organic Carbon	2.6	1.0	0.50	mg/L			1	5310 B-2011

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Client Sample ID: SMSSW09 Lab Sample ID: 680-99111-8

Lab Name: TestAmerica Savannah Job No.: 680-99111-1

SDG ID.: 68099111-1

Matrix: Water Date Sampled: 03/03/2014 10:10

CAS No.	Analyte	Result	RL	Units	С	Q	DIL	Method
18496-25-8	Sulfide	<1.0	1.0	mg/L	и		1	4500 S2 F-2011
***************************************	Alkalinity	130	5.0	mg/L			1	2320B-20 11
	Total Dissolved Solids	380	10	mg/L			1	2540C-20 11

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May 22, 2014

Ms. Denise Goddard Environmental Protection Agency, Region 4 Science and Ecosystem Support Division 980 College Station Road Athens, GA 30605-2720

SUBJECT: Data Review and Validation

Case No. NA Sample Nos. Project No. 14-0103 ESAT TDF No. 14T0401

SMSSV8-15 (reference),

SMSSV1-5, SMSSV2-10, SMSSV92-10, SMSSV3-10, SMSSV5-7, SMSSV9-10, SMSSV4-15, SMSSV6-5, SMSSV7-3

Sampling date(s): 03/05-06/14

Organic Analyses: TestAmerica, Knoxville, TN

Data for Site: Smokey Mountain Smelters, Knoxville, TN

Analysis: TO-15 (soil gas volatiles)

#### Dear Ms. Goddard:

The ESAT Work Team manually reviewed a Level 4 data package for ten soil gas (canister) grab samples analyzed for volatiles by *USEPA Compendium Method TO-15 Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)* (January 1999). Samples were collected by J.M. Waller Associates, Inc. (Atlanta, GA) utilizing the USEPA Region 4 SOP entitled *Soil Gas Sampling* (SESDPROC-307-R2, September 8, 2010). A Performance Evaluation Sample (PES) was not submitted to the laboratory for analysis with the project samples.

The samples were collected on 03/05/14 and 03/06/14 and were hand delivered to the laboratory on 03/06/14.

Data review was based primarily on the TO-15 method and the sampling SOP referenced above since neither the USEPA Region 4 organic data validation SOPs or the organic National Functional Guidelines (NFGs) were developed explicitly for this type of analysis. Particularly, calibration criteria provided by and developed for TO-15 (maximum 30% RSD for ICAL and ±30% D for CCAL with no ending CCAL check required) were used instead of the more stringent USEPA Region 4 criteria, which are not applicable to the air matrix.

The laboratory submitted a complete Level 4 data package and no data qualifications, based on the laboratory's performance are required. Acceptable calibration performance including standard verifications, BFB tuning, internal standard area and retention time stability, surrogate recoveries (BFB) compliant method blank and laboratory control sample (LCS) recoveries were demonstrated. The laboratory reported a target analyte list that was a subset of the compounds present in the calibration standards and only reported positive results that exceeded their reporting limit (RL). Values for the method detection limits (MDL) were not provided on the

reporting forms. Mass spectrum were provided for all positive results and VOC identifications that were reported.

The laboratory reported all results in both ppb v/v and µg/m3 units.

The laboratory provided the canisters used for sample analysis and provided cleaning certification data in the data package. One canister from each of the two batches were analyzed after each batch of canisters were cleaned.

Several potential sampling related issues were identified and responses to some questions were received via email (refer to the attached emails). The laboratory measured canister pressures ranging from 0.0 inches Hg to -13.8 inches Hg upon receipt (see attachment). It was stated in an email that "vacuum gauge measurements were not recorded during the field event." Gauge pressures, if taken, could have been used to verify that the canisters were in fact still evacuated prior to the sampling event and that the intended sample was collected with no subsequent leakage during transport back to the laboratory. The laboratory subsequently adjusted pressures for six of the canisters by increasing the lowest pressures upwards (see attachment) for an effective dilution. The laboratory used sample volumes of between 11 ml and 200 ml and all were brought up to 500 ml, which was the volume used for the calibration standards. Presumably the laboratory was able to achieve the desired project reporting limits using these dilutions and reduced sample volumes.

A subsequent email stated that "a reference sample was collected at sample location SMSSV8 at 15 feet." This reference (control) sample described in the Soil Gas Sampling SOP (Section 2.4 Quality Control) had positive results for m/p-xylene (2.9 ppb v/v), toluene (5.0 ppb v/v), and 1,2,4-trimethylbenzene (2.4 ppb v/v) which are very similar to many of the samples collected (see attached Client Sample Results).

Another email stated that "a duplicate sample was collected at location SMSSV02 (Client Sample IDs SMSSV2-10 and SMSSV92-10. The laboratory reported similar results for these two samples (see attached Client Sample Results). Section 2.4 of the Soil Gas Sampling SOP (Quality Control) specifies that field split samples are to be collected simultaneously by attaching the center leg of a "T" connector to the sample tubing with the remaining legs attached to two sample containers. Instead the field sampler collected two separate samples a couple of minutes apart.

Additionally, Section 2.1 of the Soil Gas Sampling SOP states that either Teflon or stainless steel tubing should be used. Polyethylene (PE) tubing was used instead. An email stated that "the tubing used for soil vapor sample collection was originally planned to be Teflon in accordance with the SESD SOP, however while attempting to thread the adaptor into the point holder at sample location SMSSV8, it was discovered that Teflon tubing did not have the rigidity to thread the adaptor into the point holder ..." it is quite possible that this modification may have biased the data (see discussion below).

An equipment rinsate blank was submitted to a separate CLP laboratory for analysis and no positive results were reported. However, an email stated that "the rinseate blank did not include the PE tubing." Since this equipment rinsate blank did not represent the entire sample path any positive sample results reported by TestAmerica could be from either the actual samples collected and/or as a result of field contamination from PE tubing.

Please refer to the attached Data Quality Assessment Record. If you have any questions, please contact this office.

Very Truly Yours:

Michael E. Keller

Chemist (Data Validation Team Lead)

Alion Science and Technology

#### Data Quality Assessment Record (DQAR)

Review 05 Date:	5/23/14	Analyses:	VOA Soil Gas by TO15	Matrix:	Air	Project #:	14-0103
SDG /Lab F	ile:	NA	· · · · · · · · · · · · · · · · · · ·				
Laboratory:	TestAm	erica, Knox	ville, TN			٠.	
Site Name:	Smokey	Mountain S	Smelters, Knoxville,	TN	· .		
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Check One: Sample Nur	•	ESAT	CLF	Other (	(specify)	11011-0111	(IIII)
· <del>_</del> ····	nbers:	ESAI	CLF	Other (	(specify)	Non-Call	
Sample Nur SMSSV8-15	nbers:	ESAI	CLF	Other	(specify)	Non-CEI	(IIII)
Sample Nur SMSSV8-15 SMSSV1-5	nbers:	ESAI	CLF	Other	specify)	Non-CEI	
Sample Nur SMSSV8-15 SMSSV1-5 SMSSV2-10	mbers:	ESAI	CLF	Other	(Specify)	Non-Call	
Sample Nur SMSSV8-15 SMSSV1-5 SMSSV2-10 SMSSV92-1	mbers:	ESAI	CLF	Other	(Specify)	Non-Call	
Sample Nur SMSSV8-15 SMSSV1-5 SMSSV2-10 SMSSV92-1	mbers:	ESAI	CLF	Other	specify)	Non-Call	
Sample Nur SMSSV8-15 SMSSV1-5 SMSSV2-10 SMSSV92-1 SMSSV3-10 SMSSV5-7	mbers:	ESAI	CLF	Other	(Specify)		
Sample Nur SMSSV8-15 SMSSV1-5 SMSSV2-10 SMSSV92-1	mbers:	ESAI	CLF	Other	(Specify)		
Sample Nur SMSSV8-15 SMSSV2-10 SMSSV92-1 SMSSV3-10 SMSSV5-7 SMSSV9-10	mbers:	ESAI	CLF	Other	specify)		

#### I. SUMMARY OF PROBLEMS AND COMMENTS:

A summary of deficiencies noted for the method used to generate data for this project is presented below. For the purposes of this review, the QC limits specified in the analytical method have been applied to the data. Data review was based primarily on the USEPA Compendium Method TO-15 Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS) (January 1999) and the USEPA Region 4 SOP entitled Soil Gas Sampling (September 8, 2010) since neither the USEPA Region 4 organic data validation SOPs or the organic National Functional Guidelines (NFGs) were explicitly developed for this type of analysis. Particularly, calibration criteria provided by and developed for TO-15 (maximum 30% RSD for ICAL and ±30% D for CCAL with no ending CCAL check required) were used instead of the tighter USEPA Region 4 criteria, which are not applicable to the air matrix.

•	Summary:	Yes	N/A	No
	Were all requested analyses performed?	X	. :	
	Were all required OC checks performed?	X		
	Were all required documents present?	<u>X</u>		
	Were requested detection limits met?		?	-
	Remark: Requested reporting limits not known to reviewer and the	٠		
	laboratory did not include MDLs on their reporting forms.		•	
	Laboratory did use reduced sample volumes and dilutions for some	<b>e</b> .		
	samples.	•	-	
		•		
	Holding Times:	Yes	N/A	No
	VOA/BNA/PEST prepared within 14 days of sampling (7 days for VOA aromatics in non-preserved samples)?	_ x	· ·	
	PCDD/PCDF extracted within 30 days of sampling?		X	
	Extracts analyzed within 40 days of extraction?		X	
	Were all samples/extracts properly preserved?	X		<u></u>
	For TCLP: Were RCRA TCLP holding times met?	<u> </u>	_ X	
	Remark:			
	A COMMAN.			
ı	GC/MS Tuning:	Yes	N/A	No
	Were PFK/DFTPP/BFB criteria met?	X		
	Pesticides: Were standards run in proper sequence?		X	<u>-</u>
	Combined DDT/Endrin Breakdown acceptable?		X	
	Retention time windows defined?		X	

4.1	Initial Calibration:	Yes	N/A	No
	Were %RSDs acceptable?	·X		
	Were RRFs acceptable?		X	
	Was S/N acceptable?		X	
	Were PCDD/PCDF ion ratios acceptable?		X	
	Remark: Initial calibration satisfied TO15 criteria.	·		
4.2	Continuing Calibration:	Yes	N/A	No
	Were %RSDs acceptable?	X		
	Were RRFs acceptable?		X	
	Were PEST cont. calib. factors met?		X	
	Was PCDD/PCDF S/N acceptable?		X	
	Were PCDD/PCDF ion ratios acceptable?		X	
5.	Remark: Continuing calibration satisfied TO15 criteria.  Spikes:	Yes	N/A	No
	Was a method spike analysis performed?	X		
	Were matrix spike/ms. duplicate analyses performed?			X
	Were acceptable recoveries obtained?	. <u>X</u>		
	Was acceptable precision obtained?		X	
	Was acceptable precision obtained?  Remark: Acceptable recoveries obtained for LCS. No measure of lal available. Acceptable precision was demonstrated for field duplicates.			
6.	Remark: Acceptable recoveries obtained for LCS. No measure of lal available. Acceptable precision was demonstrated for field duplicates.	poratory p	precision	
6.	Remark: Acceptable recoveries obtained for LCS. No measure of lal available. Acceptable precision was demonstrated for field duplicates.  Blanks:	yes		No
6.	Remark: Acceptable recoveries obtained for LCS. No measure of lal available. Acceptable precision was demonstrated for field duplicates.  Blanks:  Were blank analyses performed?	poratory p	precision	No
6.	Remark: Acceptable recoveries obtained for LCS. No measure of lal available. Acceptable precision was demonstrated for field duplicates.  Blanks:	yes	precision	

7.	Performance Evaluation Sample:	Yes	N/A	No
	Was a P.E. Sample analyzed with the samples?			_ <u>X</u>
	If yes, were acceptable results obtained?		<u>X</u>	
	Remark: No PES submitted.		·	
8.	Internal Standard / PCDD/PCDF Recovery Standards:	Yes	N/A	No
	Were peak areas acceptable?	X		
	Remark:			
9.	Surrogates / PCDD/PCDF Internal Standards:	Yes	N/A	No
	Were peak areas acceptable?	<u>X</u>	<del></del>	
	Remark:		•	
10.	Compound Identification / Quantification:	Yes	N/A	No
	Were all positive results confirmed?	X	_	
	Was supporting documentation included?	X		
	Was a check of the calculations performed?	X	?	
	If yes, were results acceptable?	X		
	PCDD/PCDF ion ratios acceptable?		X	
	Remark:			
11.	Tentatively Identified Compounds?	Yes	N/A	No
	Were TICs requested for these analyses?		X	<del></del>
	If yes, were results provided?		X	•
	Remark: TICs were not reported.			

### III. Data Summary

Based on a review of the data provided, the following is a table summarizing the data qualifiers used by Region 4 for this report.

	Recommend	ed Data Qualifiers				
NA	Project Number:	14-0103	ELEMENT Sample ID. Nos		NA	
ite Smokey Mountain Smelters, Kr			noxville, TN Date: 05/23/14			
		,	<u> </u>			
mple	Analyte(s)			ES	AT Suggested	
NA		none		none		
			·			
	······································					
		<del> </del>		<u> </u>		
	Smokey Mo	NA Project Number: Smokey Mountain Smelters, K mple Analyte(s)	Smokey Mountain Smelters, Knoxville, TN  mple Analyte(s) Laboratory Qualif	NA Project Number: 14-0103 ELEME Sample Smokey Mountain Smelters, Knoxville, TN Date: 05  mple Analyte(s) Laboratory Report/Qualifier	NA Project Number: 14-0103 ELEMENT Sample ID. Nos Smokey Mountain Smelters, Knoxville, TN Date: 05/23/14  Market Analyte(s) Laboratory Report/ Qualifier ES	

Attachuet

### TestAmerica Knoxville - Air Canister Initial Pressure Check

Analyst         Date           hmt         3/7/2014           hmt         3/7/2014	Time	Sample ID		l	Pressure @ Receipt	
hmt 3/7/201		r samplé II)	6 L	1 L	(-in or +psig)	Comments
	1 1035	140-1006-A-1	-	x	-6.2	
		140-1006-A-2	<del>                                     </del>	x	-8.5	
hmt 3/7/2014		140-1006-A-3		х	-13.8	
hmt 3/7/2014		140-1006-A-4		х	-13.4	-
hmt 3/7/2014		140-1006-A-5		х	-2.9	
hmt 3/7/2014		140-1006-A-6	-	х	-3.3	
hmt 3/7/2014	1041	140-1006-A-7		х	0.0	
hmt 3/7/2014	1042	140-1006-A-8		х	-5.9	
hmt 3/7/2014	_	140-1006-A-9		Х	0.0	
hmt 3/7/2014	1044	140-1006-A-10		Х	-2.8	
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#### **Summa Canister Dilution Worksheet**

Client: J.M. Waller Associates, Inc.

Job No.: 140-1006-1

	Canister	Preadjusted	Preadjusted	Preadjusted	Adjusted	Adjusted	Adjusted	Initial		Final			
	Volume	Pressure	Pressure	Volume	Pressure	Pressure	Volume	Volume	Dilution	Dilution			
Lab Sample ID	(L)	("Hg)	(atm)	(L)	(psig)	(atm)	(L)	(mL)	Factor	Factor	Date	Analyst	
140-1006-1	1	-6.2	0.79	0.79	+0.7	1.05	1.05		1.32	1.32	03/07/14 10:39	Taj, Holly M	
140-1006-2	1	-8.5	0.72	0.72	+0.8	1.05	1.05		1.47	1,47	03/07/14 10:41	Taj, Holly M	
140-1006-3	1	-13.8	0.54	0,54	+1.4	1.10	, 1.10	-	2.03	2.03	03/07/14 10:42	Taj, Holly M	
140-1006-4	1	-13.4	0.55	0.55	+3.3	1.22	1.22		2.22	2.22	03/07/14 10:43	Taj, Holly M	,
140-1006-5	1	-3.2	0.89	0.89	32.7	3.22	3.22		3.61	3.61	03/07/14 14:14	Barlozhetskaya, Anna F	
140-1006-5	1	0	1.00	1.00	32,7	3,22	3,22		3,22	11,62	03/07/14 14:16	Barlozhetskaya, Anna F	•
140-1006-8	1	-5,9	0,80	0.80	0.0	1.00	1.00		1.25	1.25	03/07/14 10:57	Taj, Holly M	

#### Formulae:

Preadjusted Volume (L)

= ( Preadjusted Pressure ("Hg) + 29.92 "Hg * Vol L ) / 29.92 "Hg

Adjusted Volume (L)

= ( Adjusted Pressure (psig) + 14.7 psig * Vol L ) / 14.7 psig

Dilution Factor

= Adjusted Volume (L) / Preadjusted Volume (L)

#### Where:

29.92 "Hg

= Standard atmospheric pressure in inches of Mercury ("Hg)

14.7 psig

= Standard atmospheric pressure in pounds per square inch gauge (psig)

#### **TAL Knoxville**

5815 Middlebrook Pike Knoxville, TN 37921 phone 865-291-3000 fax 865-584-4315

# **Canister Samples Chain of Custody Record**

<u>TestAmerica</u>

TestAmerica assumes no liability with respect to the collection and shipment of these samples.

THE LEADER IN ENVIRONMENTAL TESTING

Client Contact Information Company: J.M. WHLER ASSOC, INC	Project Man	مملہ:nager	VICE A	NSTIN		Sampled By:				-		Ĺ	of Z	- c	OCs			
Company: J.M. WALLER ASSOC, INC	Phone: 46	54-443	- 2777	7		ANDREY	CORIN	ink	•		ı							
Address: 100 HARTSFIELD CEVER PRWY City/State/Zipatlanta Ga 38354	Site Contac	t:							[				35.5			$\Box$		
City/State/ZipATLANTA GA 33354	TAL Contac	:t:						·	li				€ 3				i	ᅙ
Phone: 404 - 443 - 2777						•			1 1		-		section)		- 1		-	section)
FAX: 444-443-2770						•					l		8 8 8		- 1			
Project Name: SMEKEY NEW NITHING SMELTER	3	<b>Analysis</b>	Turnarour	nd Time		_					[		note				-	age
Site/location: 1508 MARYVILLE PIKE KNOW	eL€ S	tandard (Sp	ecify)_					٠ ا	\		Ì	· 1	<u>د</u> ا		- }	- 1		specify in notes
PO#		Rush (Spec	fγ)									l	90				ı	ecf
Sample Identification	Sample Date(s)		Time Stop	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, 'Hg (Stop)	Flow Controller ID	Canister ID	TO-15	TO-14A	EPA 3C	EPA 25C	ASTM D-1946	Other (Please sp	Sumple Type	Indoor Air	Ambient Air Soil Gas	Landfill Gas	Other (Please sp
' SMS SV 8 - 15 (reference	3/5/14	1565	1505		-	NA	09827	X				==	A Property of			X		
'SmssV1 -5	3/5/14	1550	1550			NA	10517	X					A STORY			Х		
' SMSSVZ-12 \ F. /	\$/5/14	1411	1611			NA	9750	Χ					R. P. ST. ST.			X		
" SMS SMZ - 10 / 1991"	7/5/14	1613	1613			NA	9591	X					- I			_\X	1_	igsqcup
'SMS5V3 - 10	7/5/14	1733	1733			NA	10741	K,					NO.SZAN			<u> </u>		_
1 Sms 5v5-7	3/5/14	1707	1707			NA	10961	メ					3345		ľ			
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	Stop	<u> </u>			<u></u>			<del> </del>	67	<u> </u>	NEV	7	NA.	101F	<u> </u>	JEW	<u>r</u>	ļ
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Special Instructions/QC Requirements & Comments		<u> </u>				<del>!</del>				1/0	1 <b>74</b> 1 (1911	HERE HAVI	<b>11</b> 6 (111)	[2 <b>1</b> ]    13	11019.)/8	in.		
										1.4	100	S Cha	in of C					
Canisters Shipped by:	Date/Time:		•		Canisters	Received by:	<del></del>			1 -70	- 100	1	un i Oi C	ustody	<i>f</i> .			
Samples Belifiquished by:	Date/Fime/	14	1345	-	Received	by:	. \ \lambda.	14	/3	. 4 -		1						
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#### **TAL Knoxville**

5815 Middlebrook Pike Knoxville, TN 37921 phone 865-291-3000 fax 865-584-4315

# **Canister Samples Chain of Custody Record**

<u>TestAmerica</u>

TestAmerica assumes no liability with respect to the collection and shipment of these samples.

THE LEADER IN ENVIRONMENTAL TESTING

Client Contact Information	Project Mar	ıager:ĴA∾	lice AL	1577 N		Sampled By:	ANDRES	3 G	Rin	ak=		2	of	<u>z</u> ,	coc	S			
Company In waller 19550C. INC	Phone: ()(	14-44	マ・フ・フ・	 フフ・															
Address: IOC HERTS FIELD CENTER PKUY #610	Site Contac	t:	, – , ,			_									1				
City/State/Zip ATLANTA GA 30354	TAL Contac										ŀ		2		. [	- 1			숱
Phone: 404-443-2777								I					용		l	1	- 1		용
FAX: 404-442-2770													98				- 1		8
Project Name: Smokey Mountain Smatte	R	Analysis	Turnarou	nd Time		,				1	ΙI		10fe			ı	ı	- 1	륄
Site/location: 1508 MARTINE PIKE KNEW ILLE		andard (Sp	ecify)						1	ļ	ļļ	. [	Ē		Ų		Į	- 1	€ੈ
PO#		Rush (Spec				•			l				ecifi		·		1	1	ge
Sample Identification	Sample Date(s)		Time Stop	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, 'Hg (Stop)	Flow Controller	Canister ID	10-16	TO-14A	EPA 3C	EPA 26C	ASTM D-1946	Other (Please specify in notes section)	samble) (yee	Indoor Air	Amblent Air	Soll Gas	Landfill Gas	Other (Please specify in notes section)
5m55v9-10	3/1/14	0950	0950			Mn	10499	Ϋ́									又		$\Box$
Sm4 5v4 -15	3/6/N	1025	1025			NA	10921	K							_		×		
5n55v6 - 5	3/6/14	1050	650			NA	10336	K									X		
* 5m55v7-3	7/6/14	1125	1/25			NA	09641	×									X		
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Sampled by :				Temperatur	e (Fahrenhei	)			_	-									
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MDL

Unit

ppb v/v

Client: J.M. Waller Associates, Inc. Project/Site: Smokey Mountain Smelter TestAmerica Job ID: 140-1006-1

Client Sample ID: SMSSV8-15

Date Collected: 03/05/14 15:05 Date Received: 03/06/14 13:45

Analyte

Benzene

Benzyl chloride

Bromomethane

Chlorobenzene

Chloroethane

Chloromethane

cis-1,2-Dichloroethene

1,2-Dichlorobenzene

1,3-Dichlorobenzene

1,4-Dichlorobenzene

1,1-Dichloroethane

Dichlorodifluoromethane

cis-1,3-Dichloropropene

1,2-Dibromoethane (EDB)

Chloroform

Carbon tetrachloride

Sample Container: Summa Canister 1L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Result Qualifier

ND

ND

ND

ND

ND

ND

ND

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ND

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Lab Sample ID: 140-1006-1

Analyzed

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1,2-Dichloroethane 1,1-Dichloroethene	ND						
1,1-Dichloroethene			2.0	ppb v/v		03/12/14 21:43	1.32
	ND		2.0	ppb v/v	•	03/12/14 21:43	1.32
1,2-Dichloropropane	ND		2.0	ppb v/v	f	03/12/14 21:43	1.32
1,2-Dichloro-1,1,2,2-tetrafluoroethand	e ND		2.0	ppb v/v		03/12/14 21:43	1.32
Ethylbenzene	. ND		2.0	ppb v/v		03/12/14 21:43	1.32
Hexachlorobutadiene	ND	•	10	ppb v/v		03/12/14 21:43	1.32
Methylene Chloride	ND		5.0	ppb v/v		03/12/14 21:43	1.32
m-Xylene & p-Xylene	2.9		2.0	ppb v/v		03/12/14 21:43	1.32
o-Xylene	ND		2.0	ppb v/v	•	03/12/14 21:43	1.32
Styrene	ND	4 1	2.0	ppb v/v		03/12/14 21:43	1.32
1,1,2,2-Tetrachloroethane	ND	•	2.0	ppb v/v		03/12/14 21:43	:1.32
Tetrachloroethene	ND		2.0	ppb v/v		03/12/14 21:43	1.32
Toluene	5.0		2.0	ppb v/v		03/12/14 21:43	1.32
trans-1,3-Dichloropropene	ND		2.0	ppb v/v	_	03/12/14 21:43	1.32
1, 2, 4-Trichlorobenzene	ND		10	ppb v/v		03/12/14 21:43	1.32
1,1.1-Trichloroethane	· ND		2.0	ppb v/v		03/12/14 21:43	1.32
1,1,2-Trichloroethane	ND		2.0	ppb v/v		03/12/14 21:43	1.32
Trichlossethene	MD		2.0	ppb v/v		03/12/14 21:43	1.32
Trichloroethene	ND		2.0	pps ***		03/12/14 21.43	
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Trichlorofluoromethane 1,1,2-Trichloro-1,2,2-trifluoroethane	ND ND		2.0	ppb v/v ppb v/v		03/12/14 21:43 03/12/14 21:43	1.32 1.32
Trichlorofluoromethane 1,1,2-Trichloro-1,2,2-trifluoroethane 1,2,4-Trimethylbenzene	ND ND <b>2.4</b>	· · · · · · · · · · · · · · · · · · ·	2.0 2.0 2.0	ppb v/v ppb v/v ppb v/v		03/12/14 21:43 03/12/14 21:43 03/12/14 21:43	1.32 1.32 1.32
Trichlorofluoromethane 1,1,2-Trichloro-1,2,2-trifluoroethane 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene	ND ND 2.4 ND ND		2.0 2.0 2.0 2.0 2.0	ppb v/v ppb v/v ppb v/v ppb v/v	Prepared	03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43	1.32 1.32 1.32 1.32
Trichlorofluoromethane 1,1,2-Trichloro-1,2,2-trifluoroethane 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene Vinyl chloride	ND ND 2.4 ND ND	Qualifler	2.0 2.0 2.0 2.0 2.0	ppb v/v ppb v/v ppb v/v ppb v/v ppb v/v	Prepared	03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43	1.32 1.32 1.32 1.32 1.32
Trichlorofluoromethane 1,1,2-Trichloro-1,2,2-trifluoroethane 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene Vinyl chloride Analyte	ND 2.4 ND ND Result	Qualifler	2.0 2.0 2.0 2.0 2.0 2.0 RL MDL	ppb v/v ppb v/v ppb v/v ppb v/v ppb v/v ppb v/v	Prepared	03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 Analyzed	1.32 1.32 1.32 1.32 1.32 Dil Fac
Trichlorofluoromethane 1,1,2-Trichloro-1,2,2-trifluoroethane 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene Vinyl chloride Analyte Benzene	ND 2,4 ND ND Result	Qualifier	2.0 2.0 2.0 2.0 2.0 2.0 <b>RL</b> MDL 6.4	ppb v/v ppb v/v ppb v/v ppb v/v ppb v/v Unit D ug/m3	Prepared	03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 Analyzed 03/12/14 21:43	1.32 1.32 1.32 1.32 1.32 Dil Fac
Trichlorofluoromethane 1,1,2-Trichloro-1,2,2-trifluoroethane 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene Vinyl chloride Analyte Benzene Benzyl chloride	ND 2.4 ND ND Result ND	Qualifier	2.0 2.0 2.0 2.0 2.0 2.0 <b>RL</b> MDL 6.4 21	ppb v/v ppb v/v ppb v/v ppb v/v ppb v/v Unit D ug/m3 ug/m3	Prepared	03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 Analyzed 03/12/14 21:43 03/12/14 21:43	1.32 1.32 1.32 1.32 1.32 Dil Fac 1.32
Trichlorofluoromethane 1,1,2-Trichloro-1,2,2-trifluoroethane 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene Vinyl chloride Analyte Benzene Benzyl chloride Bromomethane	ND 2.4 ND ND Result ND ND	Qualifler	2.0 2.0 2.0 2.0 2.0 2.0 <b>RL</b> MDL 6.4 21 7.8	ppb v/v ppb v/v ppb v/v ppb v/v ppb v/v Unit D ug/m3 ug/m3 ug/m3	Prepared	03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 Analyzed 03/12/14 21:43 03/12/14 21:43	1.32 1.32 1.32 1.32 1.32 Dil Fac 1.32 1.32
Trichlorofluoromethane 1,1,2-Trichloro-1,2,2-trifluoroethane 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene Vinyl chloride Analyte Benzene Benzyl chloride Bromomethane Carbon tetrachloride	ND 2.4 ND ND Result ND ND ND ND ND	Qualifler	2.0 2.0 2.0 2.0 2.0 2.0 <b>RL</b> MDL 6.4 21 7.8	ppb v/v ppb v/v ppb v/v ppb v/v ppb v/v Unit D ug/m3 ug/m3 ug/m3 ug/m3 ug/m3	Prepared	03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 Analyzed 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43	1.32 1.32 1.32 1.32 1.32 Dil Fac 1.32 1.32 1.32
Trichlorofluoromethane 1,1,2-Trichloro-1,2,2-trifluoroethane 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene Vinyl chloride Analyte Benzene Benzyl chloride Bromomethane Carbon tetrachloride Chlorobenzene	ND 2.4 ND ND Result ND ND ND ND ND ND ND ND ND	Qualifier	2.0 2.0 2.0 2.0 2.0 2.0 RL MDL 6.4 21 7.8 13 9.2	ppb v/v ppb v/v ppb v/v ppb v/v ppb v/v Unit ug/m3 ug/m3 ug/m3 ug/m3 ug/m3 ug/m3 ug/m3	Prepared	03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 Analyzed 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43	1.32 1.32 1.32 1.32 1.32 Dil Fac 1.32 1.32 1.32
Trichlorofluoromethane 1,1,2-Trichloro-1,2,2-triffluoroethane 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene Vinyl chloride Analyte Benzene Benzyl chloride Bromomethane Carbon tetrachloride Chlorobenzene Chloroethane	ND	Qualifier	2.0 2.0 2.0 2.0 2.0 <b>RL</b> MDL 6.4 21 7.8 13 9.2 5.3	ppb v/v ppb v/v ppb v/v ppb v/v ppb v/v Unit D ug/m3 ug/m3 ug/m3 ug/m3 ug/m3 ug/m3 ug/m3 ug/m3 ug/m3	Prepared	03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 Analyzed 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43 03/12/14 21:43	1.32 1.32 1.32 1.32 1.32 Dil Fac 1.32 1.32 1.32 1.32

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Client: J.M. Waller Associates, Inc. Project/Site: Smokey Mountain Smelter

TestAmerica Job ID: 140-1006-1

Client Sample ID: SMSSV8-15

Date Collected: 03/05/14 15:05

Date Received: 03/06/14 13:45

Sample Container: Summa Canister 1L

Lab Sample ID: 140-1006-1

Matrix: Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		7.9		ug/m3			03/12/14 21:43	1.32
cis-1,3-Dichloropropene	ND		9.1		ug/m3			03/12/14 21:43	1.32
1,2-Dibromoethane (EDB)	ND		15	* * * * * * * * * * * * * * * * * * * *	ug/m3			03/12/14 21:43	1.32
1,2-Dichlorobenzene	ND	-	12		ug/m3			03/12/14 21:43	1.32
1,3-Dichlorobenzene	ND		12		ug/m3			03/12/14 21:43	1.32
1,4-Dichlorobenzene	ND		12		ug/m3			03/12/14 21:43	1.32
Dichlorodifluoromethane	· ND		9.9		ug/m3			03/12/14 21:43	1.32
1,1-Dichloroethane	ND		8.1		ид/m3			03/12/14 21:43	1.32
1,2-Dichloroethane	ND		8.1		ug/m3			03/12/14 21:43	1.32
1,1-Dichloroethene	ND		7.9		ug/m3			03/12/14 21:43	1.32
1,2-Dichloropropane	ND	-	9.2	. * *	ug/m3		•	03/12/14 21:43	1.32
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		14		ug/m3			03/12/14 21:43	1.32
Ethylbenzene	ND.		8.7		ug/m3			03/12/14 21:43	1.32
Hexachlorobutadiene	ND		110		ug/m3			03/12/14 21:43	1.32
Methylene Chloride	ND	•	17		ug/m3			03/12/14 21:43	1.32
m-Xylene & p-Xylene	13		8.7		ug/m3			03/12/14 21:43	1.32
o-Xylene	ND		8.7		ug/m3			03/12/14 21:43	1.32
Styrene	ND:		8.5		ug/m3			03/12/14 21:43	1.32
1,1,2,2-Tetrachloroethane	ND:		14	4,1	ug/m3			03/12/14 21:43	1.32
Tetrachloroethene	ND		14	*	ug/m3			03/12/14 21:43	1.32
Toluene	19	•	7.5		ug/m3			03/12/14 21:43	1.32
trans-1,3-Dichloropropene	ND		9.1		ug/m3			03/12/14 21:43	1.32
1,2,4-Trichlorobenzene	ND		74		ug/m3	•		03/12/14 21:43	1.32
1,1,1-Trichloroethane	ND	-	11	•	ug/m3			03/12/14 21:43	1.32
1,1,2-Trichloroethane	ND		11		ug/m3			03/12/14 21:43	1.32
Trichloraethene	ND	•	11		ug/m3			03/12/14 21:43	1.32
Trichlorofluoromethane	ND		11		ug/m3			03/12/14 21:43	1.32
1,1,2-Trichloro-1,2,2-triffuorcethane	ND		15	÷	ug/m3			03/12/14 21:43	1.32
1,2,4-Trimethylbenzene	12		9.8		ug/m3			03/12/14 21:43	1.32
1,3,5-Trimethylbenzene	. ND		9.8		ug/m3			03/12/14 21:43	1.32
Vinyl chloride	ND		5.1		ug/m3			03/12/14 21:43	1.32
Surrogate	%Recovery	Qualifier	Limits	•			Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	98		60 - 140	."		_		03/12/14 21:43	1.32

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Client: J.M. Waller Associates, Inc. Project/Site: Smokey Mountain Smelter

TestAmerica Job ID: 140-1006-1

Client Sample ID: SMSSV1-5

Date Collected: 03/05/14 15:50

Lab Sample ID: 140-1006-2

Matrix: Air

Date Received: 03/06/14 13:45

Sample Container: Summa Canister 1L

Analyte		Qualifler	<u> </u>	RĹ -	MDL	Unit	<u>D</u> .	Prepared	Analyzed	Dil Fa
Benzene	ND			2.0		ppb v/v			03/12/14 22:37	1.4
Benzyl chloride	ND			4.0		ppb v/v			03/12/14 22:37	1.4
Bromomethane	ND			2.0		ppb v/v			03/12/14 22:37	1.4
Carbon tetrachloride	ND			2.0		ppb v/v			03/12/14 22:37	1.4
Chlorobenzene	ND	-		2.0		ppb v/v			03/12/14 22:37	1.4
Chloroethane	ND			2.0		ppb v/v			03/12/14 22:37	1.4
Chloroform	ND			2.0		ppb v/v			03/12/14 22:37	1.4
Chloromethane	Ю			5.0		ppb v/v		•	03/12/14 22:37	1.4
cis-1,2-Dichloroethene	ND			2.0		v/v dqq			03/12/14 22:37	1.4
cis-1,3-Dichloropropene	ND			2.0		ppb v/v			03/12/14 22:37	1.4
1,2-Dibromoethane (EDB)	ND			2.0		ppb v/v.			03/12/14 22:37	1.4
1,2-Dichlorobenzene	ND			2.0		ppb v/v			03/12/14 22:37	1,4
1,3-Dichlorobenzene	ND			2.0		ppb v/v		•	03/12/14 22:37	1.4
1,4-Dichlorobenzene	ND			2.0		ppb.v/v			03/12/14 22:37	1.4
Dichlorodifluoromethane	ND			2.0		ppb v/v			03/12/14 22:37	1.4
1,1-Dichloroethane	ND		: - /	2.0		ppb v/v			03/12/14 22:37	1.4
1,2-Dichloroethane	ND			2.0		ppb v/v			03/12/14 22:37	1.4
1,1-Dichloroethene	ND			2.0		ppb v/v			03/12/14 22:37	1.4
1,2-Dichloropropane	ND			2.0		ppb v/v			03/12/14 22:37	1.4
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND.		. 1	2.0		ppb v/v			03/12/14 22:37	1.4
Ethylbenzene	ND ND		- 1	2.0		ppb v/v			03/12/14 22:37	1.4
Hexachlorobutadiene	ND			10		ppb v/v		-	03/12/14 22:37	1.4
Methylene Chloride	ND			5.0		ppb v/v			03/12/14 22:37	1.4
·	3.2			2.0		•			03/12/14 22:37	1.4
n-Xylene & p-Xylene	the second contract and a second		. E . E			ppb v/v				
o-Xylene	ND .			2.0		ppb v/v			03/12/14 22:37	1.4
Styrene	ND			2.0		ppb v/v			03/12/14 22:37	1.4
,1,2,2-Tetrachloroethane	ND			2.0		ppb v/v			03/12/14 22:37	:1.4
[etrachloroethene	ND			2.0		ppb v/v		•	03/12/14 22:37	1.4
Foluene	3.5			2.0		ppb v/v		•	03/12/14 22:37	1,4
rans-1,3-Dichloropropene	ND			2.0		ppb v/v			03/12/14 22:37	1,4
,2,4-Trichlorobenzene	ND			10		ppb v/v			03/12/14 22:37	1.4
,1,1-Trichloroethane	ND			2.0		ppb v/v		:	03/12/14 22:37	1.4
1,1,2-Trichloroethane	ND			2.0		ppb v/v			03/12/14 22:37	1.4
richloroethene	ND		1.1	2.0		ppb v/v			03/12/14 22:37	1.4
richlorofluoromethane	. ND			2.0		ppb v/v			03/12/14 22:37	1.4
,1,2-Trichloro-1,2,2-trifluoroethane	ND			2.0		ppb v/v			03/12/14 22:37	1.4
,2,4-Trimethylbenzene	3.8			2.0	******	ppb v/v			03/12/14 22:37	1.4
,3,5-Trimethylbenzene	ND			2.0		ppb v/v		* 1	03/12/14 22:37	1.4
/inyl chloride	ND			2.0		ppb v/v			03/12/14 22:37	1.4
nalyte	Result	Qualifier		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
enzene	ND		<del></del>	6.4	-	ug/m3	<del></del>		03/12/14 22:37	1.4
tenzyl chloride	ND			21	.*	ug/m3		1.	03/12/14 22:37	1.4
romomethane	ND			7.8	:"	ug/m3			03/12/14 22:37	1.4
Carbon tetrachloride	ND.			13	:	ug/m3			03/12/14 22:37	1.4
Chlorobenzene	ND		, '	9.2		ug/m3			03/12/14 22:37	1,4
Chloroethane	ND ND			5.3		ug/m3			03/12/14 22:37	1.4
Chloroform	ND ND			9.8		A Comment		* *	03/12/14 22:37	
Chloromethane	ND			9.0 10		ug/m3 ug/m3			03/12/14 22:37	1.4 1.4

TestAmerica Knoxville

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Client: J.M. Waller Associates, inc. Project/Site: Smokey Mountain Smelter TestAmerica Job ID: 140-1006-1

Client Sample ID: SMSSV1-5

Date Collected: 03/05/14 15:50

Date Received: 03/06/14 13:45 Sample Container: Summa Canister 1L Lab Sample ID: 140-1006-2

Matrix: Air

Analyte	Resuit	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		7.9		ug/m3			03/12/14 22:37	1.47
cis-1,3-Dichloropropene	. ND		9.1	* •	ug/m3			03/12/14 22:37	1.47
1,2-Dibromoethane (EDB)	ND		15		ug/m3			03/12/14 22:37	1.47
1,2-Dichlorobenzene	ŇD		12		ug/m3			03/12/14 22:37	1.47
1,3-Dichlorobenzene	ND		12		ug/m3			03/12/14 22:37	1.47
1,4-Dichlorobenzene	ND		12		ug/m3			03/12/14 22:37	1.47
Dichlorodifluoromethane	ND		9.9		ug/m3			03/12/14 22:37	1.47
1,1-Dichloroethane	ND		8.1	:	ug/m3			03/12/14 22:37	1.47
1,2-Dichloroethane	ND		8.1		ug/m3			03/12/14 22:37	1.47
1,1-Dichloroethene	ND		7.9		ug/m3			03/12/14 22:37	1.47
1,2-Dichloropropane	ND		9.2		ug/m3			03/12/14 22:37	1.47
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	• .	14		ug/m3			03/12/14 22:37	1.47
Ethylbenzene	. ND		8.7		ug/m3			03/12/14 22:37	1.47
Hexachlorobutadiene	ND		110		ug/m3			03/12/14 22:37	1.47
Methylene Chloride	ND		17 .		.ug/m3			03/12/14 22:37	1.47
m-Xylene & p-Xylene	14		8.7		ug/m3			03/12/14 22:37	1.47
o-Xylene	ND		8.7		ug/m3			03/12/14 22:37	1.47
Styrene /	ND		8.5		ug/m3			03/12/14 22:37	. 1.47
1,1,2,2-Tetrachloroethane	ND		14		ug/m3			03/12/14 22:37	1.47
Tetrachloroethene	ND		14		ug/m3			03/12/14 22:37	1.47
Toluene	13		7.5		ug/m3			03/12/14 22:37	1.47
trans-1,3-Dichloropropene	ND		9.1		ug/m3			03/12/14 22:37	1.47
1,2,4-Trichlorobenzene	ND		74		ug/m3	** .	*	03/12/14 22:37	1.47
1,1,1-Trichloroethane	ND.		11		ug/m3			03/12/14 22:37	1.47
1,1,2-Trichloroethane	ND		11		ug/m3			03/12/14 22:37	1.47
Trichloroethene	ND		11		ug/m3			03/12/14 22:37	1.47
Trichlorofluoromethane	ND	•	11		ug/m3			03/12/14 22:37	1.47
1,1,2-Trichloro-1,2,2-trifluoroethane	ŅD		15		ug/m3			03/12/14 22:37	1.47
1,2,4-Trimethylbenzene	19		9.8		ug/m3			03/12/14 22:37	1.47
1,3,5-Trimethylbenzene	ND		9.8		ug/m3		4	03/12/14 22:37	1.47
Vinyl chloride	ND		5.1		ug/m3		·	03/12/14 22:37	1.47
Surrogate	%Recovery	Qualifier Li	mits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	100	60	- 140			_		03/12/14 22:37	1.47

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Client: J.M. Waller Associates, Inc. Project/Site: Smokey Mountain Smelter

TestAmerica Job ID: 140-1006-1

Client Sample ID: SMSSV2-10

Date Collected: 03/05/14 16:11

Chloromethane

Date Received: 03/06/14 13:45
Sample Container: Summa Canister 1L

Lab Sample ID: 140-1006-3

Matrix: Air

Analyte		Qualifler	RL	MDŁ	Unit	D	Prepared	Analyzed	Dil Fa
Benzene .	ND		2.0		ppb v/v			03/12/14 23:31	2.0
Benzyl chloride	ND		4.0		ppb v/v			03/12/14 23:31	2.0
Bromomethane	ND		2.0		ppb v/v			03/12/14 23:31	2.0
Carbon tetrachloride	ND		2.0		ppb v/v			03/12/14 23:31	2.0
Chlorobenzene	ND		2.0		ppb v/v			03/12/14 23:31	2.0
Chloroethane	ND		2.0		ppb v/v			03/12/14 23:31	2.0
Chloroform	ND		2.0	•	ppb v/v			03/12/14 23:31	2.0
Chloromethane	ND	•	5.0		ppb v/v			03/12/14 23:31	2.0
cis-1,2-Dichloroethene	ND		2.0		ppb v/v			03/12/14 23:31	2.0
cis-1,3-Dichloropropene	ND		2.0		ppb v/v	•		03/12/14 23:31	2.0
1,2-Dibromoethane (EDB)	ND		2.0		ppb v/v			03/12/14 23:31	2.0
1,2-Dichlorobenzene	ND		2.0		ppb v/v			03/12/14 23:31	2.0
1,3-Dichlorobenzene	ND	•	2.0		ppb v/v			03/12/14 23:31	2.0
1,4-Dichlorobenzene	ND		2.0		ppb v/v			03/12/14 23:31	2.0
Dichlorodifluoromethane	ND		2.0		ppb v/v		·	03/12/14 23:31	2.0
1,1-Dichloroethane	ND		2.0		ppb v/v			03/12/14 23:31	2.0
1,2-Dichloroethane	ND		2.0		ppb v/v			03/12/14 23:31	2.0
1,1-Dichloroethene	ND		2.0		ppb v/v			03/12/14 23:31	. 2.0
1,2-Dichloropropane	ND		2.0		ppb v/v			03/12/14 23:31	2.0
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	•	2.0		ppb v/v			03/12/14 23:31	2.6
Ethylbenzene	ND		2.0		ppib v/v			03/12/14 23:31	2.
Hexachlorobutadiene	ND		10		ppb v/v	-		03/12/14 23:31	2.0
Methylene Chloride	ND	. <del>'</del>	5.0		ppb v/v			03/12/14 23:31	2.0
m-Xylene & p-Xylene	3.1		2.0		ppb v/v			03/12/14 23:31	2.0
o-Xylene	ND		2.0		ppb v/v			03/12/14 23:31	2.0
Styrene	ND		2.0		ppb v/v			03/12/14 23:31	2.0
1,1,2,2-Tetrachloroethane	ND		2.0		ppb v/v			03/12/14 23:31	2.0
Tetrachloroethene	ND		2.0		ppb v/v		•	03/12/14 23:31	2.0
Toluene	3.7		2.0		ppb v/v			03/12/14 23:31	2.0
trans-1,3-Dichloropropene	ND		2.0		ppb v/v			03/12/14 23:31	2.0
1,2,4-Trichlorobenzene	, ND ND		10		27.22.00			03/12/14 23:31	2.0
	ND				ppb v/v				
1,1,1-Trichloroethane			2.0		ppb v/v			03/12/14 23:31	2.0
1,1,2-Trichloroethane	ND	4.1	2.0		ppb v/v			03/12/14 23:31	2.0
Trichloroethene	ND		2.0		opb v/v			03/12/14 23:31	2.0
Trichlorofluoromethane	ND	÷	2.0		ppb v/v			03/12/14 23:31	2.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2.0		ppb v/v			03/12/14 23:31	2.0
1,2,4-Trimethylbenzene	3.0		2.0		ppb v/v			03/12/14 23:31	2.0
1,3,5-Trimethylbenzene	ND		2.0		ppb v/v			03/12/14 23:31	2.0
/inyl chloride	ND		2.0		bbp n/n			03/12/14 23:31	2.0
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Benzene	ND		6.4		ug/m3			03/12/14 23:31	2.0
Benzyl chloride	ND		21		ug/m3		e ⁴	03/12/14 23:31	2.0
Bromomethane	ND		7.8		ug/m3			03/12/14 23:31	2.0
Carbon tetrachlonde	NĐ		13		ug/m3			03/12/14 23:31	2.0
Chlorobenzene	ND	•	9.2		ug/m3			03/12/14 23:31	2.0
Chloroethane	ND.		5.3		ug/m3			03/12/14 23:31	2.0
Chloroform	ND		9.8	4 4 4	ug/m3			03/12/14 23:31	2.0
	_								

TestAmerica Knoxville

2.03

03/12/14 23:31

3/20/2014

10

ug/m3

ND

. 1 

Client: J.M. Waller Associates, Inc. Project/Site: Smokey Mountain Smelter TestAmerica Job ID: 140-1006-1

Client Sample ID: SMSSV2-10

Date Collected: 03/05/14 16:11

Date Received: 03/06/14 13:45

Sample Container: Summa Canister 1L

Lab Sample ID: 140-1006-3

Matrix: Air

Analyte	Result	Qualifier	, F	₹L.	MD	L Unit	•	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	. ND		7	7.9		ug/m3			:	03/12/14 23:31	2.03
cis-1,3-Dichloropropene	ND			.1		ug/m3				03/12/14 23:31	2.03
1,2-Dibromoethane (EDB)	ND			15		ug/m3				03/12/14 23:31	2.03
1,2-Dichlorobenzene	ŅD			12	. '	ug/m3				03/12/14 23:31	2.03
1,3-Dichlorobenzene	ND			12		ug/m3				03/12/14 23:31	2.03
1,4-Dichlorobenzene	, ND			12		ug/m3				03/12/14 23:31	2.03
Dichlorodifluoromethane	ND		9	.9		ug/m3				03/12/14 23:31	2.03
1,1-Dichloroethane	ND		8	.1		ug/m3				03/12/14 23:31	2.03
1,2-Dichloroethane	ND		8	.1		ug/m3				03/12/14 23:31	2.03
1,1-Dichloroethene	ND		7	.9		ug/m3				03/12/14 23:31	2.03
1,2-Dichloropropane	ND		. 9	.2		ug/m3				03/12/14 23:31	2.03
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND			14		ug/m3				03/12/14 23:31	2.03
Ethylbenzene	ND		8	.7		ug/m3				03/12/14 23:31	2,03
Hexachtorobutadiene	ND		11	10	-1	ug/m3				03/12/14 23:31	2.03
Methylene Chloride	ND			17		ug/m3				03/12/14 23:31	2.03
m-Xylene & p-Xylene	13		. 8	.7		ug/m3				03/12/14 23:31	2.03
o-Xylene	ND		8	7		ug/m3				03/12/14 23:31	2.03
Styrene	ND		8	.5	:	ug/m3			1 1	03/12/14 23:31	2.03
1,1,2,2-Tetrachloroethane	ND		1	4		ug/m3				03/12/14 23:31	2.03
Tetrachtoroethene	ND	• •	. 1	4		ug/m3				03/12/14 23:31	2.03
Toluene	14		7	.5		ug/m3				03/12/14 23:31	2.03
trans-1,3-Dichloropropene	ND		. 9	.1		ug/m3				03/12/14 23:31	2.03
1,2,4-Trichlorobenzene	ND		7	4		ug/m3				03/12/14 23:31	2.03
1,1,1-Trichloroethane	ND		1	1		ug/m3			÷	03/12/14 23:31	2.03
1,1,2-Trichloroethane	ND		. 1	1		ug/m3	1 .			03/12/14 23:31	2.03
Trichloroethene	ND		1	1		ug/m3				03/12/14 23:31	2.03
Trichlorofluoromethane	ND		1	1	1 .	ug/m3				03/12/14 23:31	2.03
1,1,2-Trichloro-1,2,2-trifluoroethane	ŅD		. 1	5		ug/m3			*	03/12/14 23:31	2.03
1,2,4-Trimethylbenzene	15		9	8	Assess .	ug/m3				03/12/14 23:31	2.03
1,3,5-Trimethylbenzene	ND		. 9.	8		ug/m3				03/12/14 23:31	2.03
Vinyl chloride	ND		5	.1		ug/m3				03/12/14 23:31	2.03
Surrogate	%Recovery	Qualifier	Limits		: 2				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	97		60 - 140	_	1.			_	* -	03/12/14 23:31	2.03

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Client: J.M. Waller Associates, Inc. Project/Site: Smokey Mountain Smelter

TestAmerica Job ID: 140-1006-1

Client Sample ID: SMSSV92-10

Date Collected: 03/05/14 16:13 Date Received: 03/06/14 13:45

Chloromethane

Sample Container: Summa Canister 1L

Lab Sample ID: 140-1006-4

Matrix: Air

Analyte	Result	Qualifier	RI RI	<u> </u>	MDL Unit	D	Prepared	Analyzed	Dil Fa
Benzene	ND		2.	0	ppb v/v			03/13/14 00:25	2.2
Benzyl chloride	ND		4.	0	ppb v/v			03/13/14 00:25	2.2
Bromomethane	ND		2.0	0	ppb v/v			03/13/14 00:25	2.2
Carbon tetrachloride	ND		2.	0	ppb v/v			03/13/14 00:25	2.2
Chlorobenzene	ND		2.6	0	ppb v/v :			03/13/14 00:25	2.2
Chloroethane	ND		2.6	0	ppb v/v			03/13/14 00:25	2.2
Chloroform	, ND		2.0	נ	ppb v/v			03/13/14 00:25	2.2
Chloromethane	ND		5.0	o ·	ppb v/v			03/13/14 00:25	2.2
cis-1,2-Dichloroethene	ND		2.0	o ^r	ppb v/v			03/13/14 00:25	2.2
cis-1,3-Dichloropropene	ND		2.0	)	ppb v/v			03/13/14 00:25	2.2
1,2-Dibromoethane (EDB)	ND		2.0	)	ppb v/v			03/13/14 00:25	. 2.2
1,2-Dichlorobenzene	ND		2.0		ppb v/v			03/13/14 00:25	2.2
1,3-Dichlorobenzene	ND		2.0	)	ppb v/v			03/13/14 00:25	2.2
1,4-Dichlorobenzene	ND		2.0		ppb v/v			03/13/14 00:25	2.2
Dichlorodifluoromethane	ND		2.0		ppb v/v			03/13/14 00:25	2.2
1,1-Dichtoroethane	ND	:	2.0		ppb v/v	•		03/13/14 00:25	2.2
1,2-Dichloroethane	ND		2.0		ppb v/v			03/13/14 00:25	2.2
1,1-Dichloroethene	ND		2.0		ppb v/v			03/13/14 00:25	2.2
1,2-Dichloropropane	ND		2.0		ppb v/v			03/13/14 00:25	2.2
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.0		ppb v/v			03/13/14 00:25	2.2
Ethylbenzene	ND		2.0		ppb v/v			03/13/14 00:25	2.2
Hexachlorobutadiene	ND		10		ppb v/v			03/13/14 00:25	2.2
Methylene Chloride	ND		5.0		ppb v/v			03/13/14 00:25	2.2
•			2.0		ppb v/v			03/13/14 00:25	2.2
m-Xylene & p-Xylene o-Xylene	2.8 ND		2.0		and the second			03/13/14 00:25	2.2
Styrene	ND		2.0		ppb v/v			03/13/14 00:25	2.2
-			2.0		ppb v/v			03/13/14 00:25	
1,1,2,2-Tetrachloroethane	ND				ppb v/v				2.2
Tetrachloroethene	ND		2.0		ppb v/v			03/13/14 00:25	2.2
Toluene	3.3		2.0		ppb v/v			03/13/14 00:25	2.2
trans-1,3-Dichloropropene	ND		2.0		ppb v/v			03/13/14 00:25	2.2
1,2,4-Trichlorobenzene	ND		10		ppb v/v			03/13/14 00:25	2.2
1,1,1-Trichloroethane	ŅD		2.0		ppb v/v			03/13/14 00:25	2.2
1,1,2-Trichloroethane	ND		2.0		ppb v/v			03/13/14 00:25	2.2
Trichloroethene	ND		2.0		ppb v/v			03/13/14 00:25	2.2
Trichlorofluoromethane	ND		2.0		ppb v/v			03/13/14 00:25	2.2
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2,0		ppb v/v			03/13/14 00:25	2.2
I,2,4-Trimethylbenzene	2,7		2.0	,	ppb v/v			03/13/14 00:25	2.2
1,3,5-Trimethylbenzene	ND		2.0		ppb v/v			03/13/14 00:25	2.2
/inyl chloride	ND		2.0		v/v dqq			03/13/14 00:25	2.2
Analyte	Result	Qualifier	RL	. , N	IDL Unit	D	Prepared	Analyzed	Dii Fa
Benzene	ND		6.4		ug/m3			03/13/14 00:25	2.2
Benzyl chloride	ND		21		ug/m3			03/13/14 00:25	2.2
Bromomethane	ND		7.8		ug/m3			03/13/14 00:25	2.2
Carbon tetrachionide	ND		13		ug/m3			03/13/14 00:25	2.2
Chlorobenzene	ND		9.2		ug/m3			03/13/14 00:25	2.2
Chloroethane	ND		5.3		ug/m3			03/13/14 00:25	2.2
Chloroform	ND.		9.8	A Charles and A	ug/m3	•		03/13/14 00:25	2.2
Statement of the second									

TestAmerica Knoxville

03/13/14 00:25

ug/m3

ND

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Client: J.M. Waller Associates, Inc. Project/Site: Smokey Mountain Smelter

TestAmerica Job ID: 140-1006-1

Client Sample ID: SMSSV92-10

Date Collected: 03/05/14 16:13

Date Received: 03/06/14 13:45

Sample Container: Summa Canister 1L

Lab Sample ID: 140-1006-4

Matrix: Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		7.9		ug/m3			03/13/14 00:25	2.22
cis-1,3-Dichloropropene	ND		9.1		ug/m3			03/13/14 00:25	2.22
1,2-Dibromoethane (EDB)	NĐ		15		ug/m3			03/13/14 00:25	2.22
1,2-Dichlorobenzene	ND		12		ug/m3			03/13/14 00:25	2.22
1,3-Dichlorobenzene	ND		12		ug/m3			03/13/14 00:25	2.22
1,4-Dichlorobenzene	ND		12		ug/m3			03/13/14 00:25	2.22
Dichlorodifluoromethane	ND		9.9		ug/m3			03/13/14 00:25	2.22
1,1-Dichloroethane	ND		8.1		ug/m3			03/13/14 00:25	2.22
1,2-Dichloroethane	ND		8.1		ug/m3			03/13/14 00:25	2.22
1,1-Dichloroethene	ND		7.9		ug/m3			03/13/14 00:25	2.22
1,2-Dichloropropane	ND		9.2	•	ug/m3			03/13/14 00:25	2.22
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		14		ug/m3			03/13/14 00:25	2.22
Ethylbenzene	ND		8.7		ug/m3			03/13/14 00:25	2.22
Hexachlorobutadiene	ND		110		ug/m3		+ 1,	03/13/14 00:25	2.22
Methylene Chloride	ND		17		ug/m3			03/13/14 00:25	2.22
m-Xylene & p-Xylene	12		8.7		ug/m3			03/13/14 00:25	2.22
o-Xylene	ND		8.7		ug/m3			03/13/14 00:25	2.22
Styrene	ND		8.5		ug/m3			03/13/14 00:25	2.22
1,1,2,2-Tetrachloroethane	· ND		14	,	ug/m3			03/13/14 00:25	2.22
Tetrachloroethene	ND		14		ug/m3			03/13/14 00:25	2.22
Toluene	12		7.5		ug/m3		-	03/13/14 00:25	2.22
trans-1,3-Dichloropropene	ND		9.1		ug/m3			03/13/14 00:25	2.22
1,2,4-Trichlorobenzene	ND		74		ug/m3	-		03/13/14 00:25	2.22
1,1,1-Trichloroethane	ND		11		ug/m3			03/13/14 00:25	2.22
1,1,2-Trichloroethane	ND		11		ug/m3			03/13/14 00:25	2.22
Trichloroethene	ŊD		11		ug/m3			03/13/14 00:25	2.22
Trichlorofluoromethane	ND		<b>11</b> .		ug/m3			03/13/14 00:25	2.22
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		15		ug/m3			03/13/14 00:25	2.22
1,2,4-Trimethylbenzene	13	•	9.8		ug/m3			03/13/14 00:25	2.22
1,3,5-Trimethylbenzene	ND		9.8		ug/m3			03/13/14 00:25	2.22
/inyl chloride	ND		5.1		ug/m3			03/13/14 00:25	2.22
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	98	•	60 - 140			-		03/13/14 00:25	2.22

Client: J.M. Waller Associates, Inc. Project/Site: Smokey Mountain Smelter TestAmerica Job ID: 140-1006-1

Client Sample ID: SMSSV3-10

Date Collected: 03/05/14 17:33

Date Received: 03/06/14 13:45

Sample Container: Summa Canister 1L

Lab Sample ID: 140-1006-5

Matrix: Air





Benzy   Chordode	Method: TO-15 - Volatile Orga Analyte	-	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Benzyl chloride ND 46 ppb w/ Brommethane ND 23 ppb w/ 30/13/14 08:29 Brommethane ND 23 ppb w/ 30/13/14 08:29 Chloroberzene ND 23 ppb w/ 30/13/14 08:29 Cel-13-Dichioropopene ND 23 ppb w/ 30/13/14 08:29 Cel-14-Dichioropopene ND 23 ppb w/	<del></del>	<del></del> ·								11.6
Bromomehane         ND         2.3         ppb w/         03/13/14 08:28           Catrbon betrachiodie         ND         2.3         ppb w/         03/13/14 08:28           Chlorochane         ND         2.3         ppb w/         03/13/14 08:29           Chlorochane         ND         2.3         ppb w/         03/13/14 08:29           Chloromethane         9.8         5.8         ppb w/         03/13/14 08:29           Chloromethane         ND         2.3         ppb w/         03/13/14 08:29           cis-12-Dichlorochane         ND         2.3         ppb w/         03/13/14 08:29           cis-12-Dichlorochane         ND         2.3         ppb w/         03/13/14 08:29           1.2-Dichlorochane         ND         2.3         ppb w/         03/13/14 08:29           1.3-Dichlorochane         ND         2.3         ppb w/         03/13/14 08:29           1.1-Dichlorochane         ND         2.3 <td< td=""><td>•</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>03/13/14 08:29</td><td>11.6</td></td<>	•								03/13/14 08:29	11.6
Cabbin terachioride         ND         2.3         ppb v/v         03/13/14 08:29           Chilorobenzene         2.9         2.3         ppb v/v         03/13/14 08:29           Chilorotethane         ND         2.3         ppb v/v         03/13/14 08:29           Chilorotethane         9.8         5.8         ppb v/v         03/13/14 08:29           ciel-12-Chilorotethane         ND         2.3         ppb v/v         03/13/14 08:29           ciel-13-Dichlorotethane         ND         2.3         ppb v/v         03/13/14 08:29           112-Dichorotethane (EIDP)         ND         2.3         ppb v/v         03/13/14 08:29           112-Dichorotethane (EIDP)         ND         2.3         ppb v/v         03/13/14 08:29           112-Dichorotethane (EIDP)         ND         2.3         ppb v/v         03/13/14 08:29           112-Dichorotethane         ND         2.3         ppb v/v         03/13/14 08:29           11, Dichilorotethane         4,4         2.3         ppb v/v         03/13/14 08:29           11, Dichilorotethane         5,4         2.3         ppb v/v         03/13/14 08:29           11, Dichilorotethane         5,4         2.3         ppb v/v         03/13/14 08:29           11,	•				:	• •			03/13/14 08:29	11.6
Chloroethane	Carbon tetrachloride	Activities and a second control of						12000	03/13/14 08:29	11.6
Chlorestane										11.6
Chlororom ND 2.3 ppb v/v 03/13/14 08:29 cis-1.3-Dichloromethane 9.8 5.8 ppb v/v 03/13/14 08:29 cis-1.3-Dichloromethane ND 2.3 ppb v/v 03/13/14 08:29 ppb v/v 03/13/14 08:29 cis-1.3-Dichloromethane ND 2.3 ppb v/v 03/13/14 08:29 ppb v/v 03/13/14 08						• • •			03/13/14 08:29	11.6
Chloromethane         9,8         5,8         ppb v/v         03/13/14 08:29           dei-1,2-Dichloropethane         ND         2,3         ppb v/v         03/13/14 08:29           dei-1,3-Dichloropethane         ND         2,3         ppb v/v         03/13/14 08:29           1,2-Dichloropethane         ND         2,3         ppb v/v         03/13/14 08:29           1,3-Dichlorobenzene         ND         2,3         ppb v/v         03/13/14 08:29           1,4-Dichlorobenzene         ND         2,3         ppb v/v         03/13/14 08:29           1,4-Dichlorobenzene         ND         2,3         ppb v/v         03/13/14 08:29           1,4-Dichlorobenzene         ND         2,3         ppb v/v         03/13/14 08:29           1,1-Dichlorobenzene         ND         2,3         ppb v/v         03/13/14 08:29           1,2-Dichloropethane         ND         2,3         ppb v/v         03/13/14 08:29           1,2-Dichloropethan	Chloroform								03/13/14 08:29	11.6
cis-1,2-Dicthoroethane         ND         2,3         ppb w/         03/13/14 08:29           cis-1,3-Dichioropropease         ND         2,3         ppb w/         03/13/14 08:29           1,2-Dichioropropease         ND         2,3         ppb w/         03/13/14 08:29           1,3-Dichiorotenzone         ND         2,3         ppb w/         03/13/14 08:29           1,3-Dichiorotenzone         ND         2,3         ppb w/         03/13/14 08:29           1,3-Dichiorotenzone         ND         2,3         ppb w/         03/13/14 08:29           Dichiforotifiucomethane         ND         2,3         ppb w/         03/13/14 08:29           1,1-Dichiorotethane         5,4         2,3         ppb w/         03/13/14 08:29           1,1-Dichiorotethane         ND         2,3         ppb w/         03/13/14 08:29           1,2-Dichiorotethane<	Control of the Contro		*						03/13/14 08:29	11.6
cis-1,3-Dichloropropense         ND         2,3         ppb v/v         03/13/14 08/29           1,2-Dichromeethane (EDB)         ND         2,3         ppb v/v         03/13/14 08/29           1,3-Dichlorostenzene         ND         2,3         ppb v/v         03/13/14 08/29           1,3-Dichlorostenzene         ND         2,3         ppb v/v         03/13/14 08/29           1,4-Dichlorostenzene         ND         2,3         ppb v/v         03/13/14 08/29           1,4-Dichlorostenzene         ND         2,3         ppb v/v         03/13/14 08/29           1,1-Dichlorostenzene         6,4         2,3         ppb v/v         03/13/14 08/29           1,2-Dichlorostenzene         ND         1,2         ppb v/v         03/13/14 08/29 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>03/13/14 08:29</td><td>11.6</td></td<>									03/13/14 08:29	11.6
1,2-Dichiorobenzene ND 2,3 ppb v/v 03/13/14 08:29 1,2-Dichiorobenzene ND 2,3 ppb v/v 03/13/14 08:29 1,1-Dichiorobenzene ND 12 ppb v/v 03/13/14 08:29 1-Dichiorobenzene ND 2,3 ppb v/v 03/13/14 08:29 1-Di			*						03/13/14 08:29	11.6
1,2-Dichlorobenzene ND 2,3 ppb vV 03/13/14 08:29 1,3-Dichlorobenzene ND 2,3 ppb vV 03/13/14 08:29 1,3-Dichlorobenzene ND 2,3 ppb vV 03/13/14 08:29 Dichlorodiffuoromethane ND 2,3 ppb vV 03/13/14 08:29 Dichlorodiffuoromethane ND 2,3 ppb vV 03/13/14 08:29 1,1-Dichloroethane A,4 2,3 ppb vV 03/13/14 08:29 1,1-Dichloroethane 5,4 2,3 ppb vV 03/13/14 08:29 1,1-Dichloroethane ND 1,2 3 ppb vV 03/13/14 08:29 1,1-Dichloroethane ND 2,3 ppb vV 03/13/14 08:29 1,1-D									•	11.6
1,3-Dichlorobenzane ND 2,3 ppb w/ 03/13/14 08:29 1,4-Dichlorobenzane ND 2,3 ppb w/ 03/13/14 08:29 1,4-Dichlorobenzane ND 2,3 ppb w/ 03/13/14 08:29 1,1-Dichlorocethane ND 2,3 ppb w/ 03/13/14 08:29 1,1-Dichlorocethane A,4 2,3 ppb w/ 03/13/14 08:29 1,1-Dichlorocethane ND 2,3 ppb w/ 03/13/14 08:29 1,2-Dichlorocethane ND 2,3 ppb w/ 03/13/14 08:29 1,1,2-Dichlorocethane ND 2,3 ppb w/ 03/13/14 08:29 1,1,2-Dichlorocethane ND 2,3 ppb w/ 03/13/14 08:29 1,1,2-Dichloropopane ND 2,3 ppb w/ 03/13/14 08:29 1,1,2-Tichlorocethane ND 2,3 ppb w/ 03/13/14 08:29 1,1,2-Tichlo										11.6
1,4-Dichlorobenzene ND 2,3 ppb v/v 03/13/14 08:29 Dichlorodifluoromethane ND 2,3 ppb v/v 03/13/14 08:29 1,1-Dichloroethane A.4 2,3 ppb v/v 03/13/14 08:29 1,1-Dichloroethane ND 12 ppb v/v 03/13/14 08:29 1,1-Dichloroethane ND 2,3 ppb v/v									and the second second	11.6
Dichloradiflucromethane					•					11.6
1,1-Dichloroethane         4,4         2,3         ppb v/v         03/13/14 08:29           1,2-Dichloroethane         5,4         2,3         ppb v/v         03/13/14 08:29           1,2-Dichloroethane         ND         2,3         ppb v/v         03/13/14 08:29           1,2-Dichloropropane         ND         2,3         ppb v/v         03/13/14 08:29           1,2-Dichloro-1,1,2,2-tetrafluoroethane         ND         2,3         ppb v/v         03/13/14 08:29           Ethylborazene         12         2,3         ppb v/v         03/13/14 08:29           Ethylborazene         12         2,3         ppb v/v         03/13/14 08:29           Methylene Chloride         12         5,8         ppb v/v         03/13/14 08:29           Methylene Chloride         12         5,8         ppb v/v         03/13/14 08:29           m-Xylene         7,3         2,3         ppb v/v         03/13/14 08:29           Syrene         7,3         2,3         ppb v/v         03/13/14 08:29           Syrene         ND         2,3         ppb v/v         03/13/14 08:29           Tetrachloroethane         ND         2,3         ppb v/v         03/13/14 08:29           Tetrachloroethane         ND <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>11.6</td></td<>										11.6
1,2-Dichloroethane 1,0-Dichloroethane ND 2,3 ppb v/v 03/13/14 08:29 1,1-Dichloroethane ND 2,3 ppb v/v 03/13/14 08:29 1,2-Dichloroethane ND 1,2 ppb v/v 03/13/14 08:29 1,3-Dichloroethane ND 2,3 ppb v/v 03/13/14 08:29 1,3-Dichloroethane ND 2,3 ppb v/v 03/13/14 08:29 1,1-Dichloroethane ND 2,3 ppb v/v 03/13/14 08:29 1,1,2-Tichloroethane ND 2,3 ppb v/v 03/13/14 08:29 1,1,1-Tichloroethane ND 2,3 ppb v/v 03/13/14 08:29 1,1,2-Tichloroethane ND 2,3 ppb v/v 03/13/14 08:29 1,1,2-Tichl	the continue of the continue o									11.6
1,1-Dichloroethene         ND         2,3         ppb v/v         03/13/14 08:29           1,2-Dichloropropane         ND         2,3         ppb v/v         03/13/14 08:29           1,2-Dichlorop-1,1,2-letrafluoroethane         ND         2,3         ppb v/v         03/13/14 08:29           Ethylbenzene         12         2,3         ppb v/v         03/13/14 08:29           Hexachlorobutadiene         ND         12         ppb v/v         03/13/14 08:29           Methylene Chloride         12         5,8         ppb v/v         03/13/14 08:29           Methylene Chloride         13         2,3         ppb v/v         03/13/14 08:29           mx-Xylene         13         2,3         ppb v/v         03/13/14 08:29           Styrene         1,0         2,3         ppb v/v         03/13/14 08:29           Styrene         ND         2,3         ppb v/v         03/13/14 08:29           1,1,2-2-Terkohloroethane         ND         2,3         ppb v/v         03/13/14 08:29           Toluene         32         2,3         ppb v/v         03/13/14 08:29           Toluene         32         2,3         ppb v/v         03/13/14 08:29           1,2-4-Trichloroethane         ND         2,3 <td>The second secon</td> <td></td> <td></td> <td>,</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>11.6</td>	The second secon			,						11.6
1,2-Dichloropropane	•	:								11.6
1,2-Dichloro-1,1,2,2-tetrafluoroethane   ND   2.3   ppb v/v   03/13/14 08:29	Caraca a contra de la caraca de la contra della contra de	and the second second				elika ereka				11.6
Ethylbenzene						111				11.6
Hexachlorobutadiene         ND         12         ppb v/v         03/13/14 08:29           Methylene Chloride         12         5.8         ppb v/v         03/13/14 08:29           m-Xylene         13         2.3         ppb v/v         03/13/14 08:29           Styrene         7.3         2.3         ppb v/v         03/13/14 08:29           Styrene         ND         2.3         ppb v/v         03/13/14 08:29           Tetrachloroethane         ND         2.3         ppb v/v         03/13/14 08:29           Tetrachloroethene         ND         2.3         ppb v/v         03/13/14 08:29           Toluene         32         2.3         ppb v/v         03/13/14 08:29           Toluene         32         2.3         ppb v/v         03/13/14 08:29           1,2.4-Trichlorobenzene         ND         2.3         ppb v/v         03/13/14 08:29           1,1.2-Trichloroethane         ND         2.3         ppb v/v         03/13/14 08:29           1,1.2-Trichloroethane         ND         2.3         ppb v/v         03/13/14 08:29           Trichloroethane         ND         2.3         ppb v/v         03/13/14 08:29           Trichloroethane         ND         2.3         ppb v/v<	· · · · · · · · · · · · · · · · · · ·									11.6
Methylene Chloride         12         5.8         ppb v/v         03/13/14 08:29           m-Xylene & p-Xylene         13         2.3         ppb v/v         03/13/14 08:29           o-Xylene         7.3         2.3         ppb v/v         03/13/14 08:29           Styrene         ND         2.3         ppb v/v         03/13/14 08:29           Tetrachloroethane         ND         2.3         ppb v/v         03/13/14 08:29           Tetrachloroethene         ND         2.3         ppb v/v         03/13/14 08:29           Toluene         32         2.3         ppb v/v         03/13/14 08:29           Trans-1,3-Dichloropropene         ND         2.3         ppb v/v         03/13/14 08:29           Trans-1,3-Dichloropropene         ND         1.2         ppb v/v         03/13/14 08:29           1,2,4-Trichloroethane         ND         2.3         ppb v/v         03/13/14 08:29           1,1,2-Trichloroethane         ND         2.3         ppb v/v         03/13/14 08:29           Trichloroethane         ND         2.3         ppb v/v         03/13/14 08:29           Trichloroethane         ND         2.3         ppb v/v         03/13/14 08:29           Trichloroethane         ND <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td>11.63</td></th<>								-		11.63
13   2.3   ppb v/v   03/13/14 08:29						•				11.6
Styrene   7.3   2.3   ppb v/v   03/13/14 08:29	<del>-</del>									11.6
Styrene         ND         2.3         ppb v/v         03/13/14 08:29           1,1,2,2-Tetrachloroethane         ND         2.3         ppb v/v         03/13/14 08:29           Tetrachloroethene         ND         2.3         ppb v/v         03/13/14 08:29           Toluene         32         2.3         ppb v/v         03/13/14 08:29           trans-1,3-Dichloropropene         ND         2.3         ppb v/v         03/13/14 08:29           1,1,1-Trichloroethane         ND         12         ppb v/v         03/13/14 08:29           1,1,1-Trichloroethane         ND         2.3         ppb v/v         03/13/14 08:29           1,1,2-Trichloroethane         ND         2.3         ppb v/v         03/13/14 08:29           Trichloroethene         ND         2.3         ppb v/v         03/13/14 08:29           Trichlorofluoromethane         ND         2.3         ppb v/v         03/13/14 08:29           Trichloro-1,2,2-trifluoroethane         ND         2.3         ppb v/v         03/13/14 08:29           1,1,2-Trichloro-1,2,2-trifluoroethane         ND         2.3         ppb v/v         03/13/14 08:29           1,1,2-Trimethylbenzene         6.8         2.3         ppb v/v         03/13/14 08:29           <	na fikalasi (n. fayah sasar) i	the second control of the second				The second			and the second second second	11.6
1,1,2,2-Tetrachloroethane         ND         2.3         ppb v/v         03/13/14 08:29           Tetrachloroethene         ND         2.3         ppb v/v         03/13/14 08:29           Toluene         32         2.3         ppb v/v         03/13/14 08:29           trans-1,3-Dichloropropene         ND         2.3         ppb v/v         03/13/14 08:29           1,2,4-Trichloroethane         ND         1.2         ppb v/v         03/13/14 08:29           1,1,2-Trichloroethane         ND         2.3         ppb v/v         03/13/14 08:29           Trichloroethane         ND         2.3         ppb v/v         03/13/14 08:29           Trichloroethene         ND         2.3         ppb v/v         03/13/14 08:29           Trichloroethane         ND         2.3         ppb v/v         03/13/14 08:29           1,2,4-Trimethylbenzene         6.8 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>•</td> <td></td> <td></td> <td>11.6</td>							•			11.6
Tetrachloroethene ND 2.3 ppb v/v 03/13/14 08:29 Toluene 32 2.3 ppb v/v 03/13/14 08:29 trans-1,3-Dichloropropene ND 2.3 ppb v/v 03/13/14 08:29 1,2,4-Trichloroethane ND 12 ppb v/v 03/13/14 08:29 1,1,1-Trichloroethane ND 2.3 ppb v/v 03/13/14 08:29 1,1,1-Trichloroethane ND 2.3 ppb v/v 03/13/14 08:29 1,1,2-Trichloroethane ND 2.3 ppb v/v 03/13/14 08:29 Trichloroethane ND 2.3 ppb v/v 03/13/14 08:29 Trichloroethane ND 2.3 ppb v/v 03/13/14 08:29 Trichloroethane ND 2.3 ppb v/v 03/13/14 08:29 1,1,2-Trichloro-1,2,2-trifluoroethane ND 2.3 ppb v/v 03/13/14 08:29 1,1,2-Trichloro-1,2,2-trifluoroethane ND 2.3 ppb v/v 03/13/14 08:29 1,1,2-Trichloro-1,2,2-trifluoroethane ND 2.3 ppb v/v 03/13/14 08:29 1,1,3-5-Trimethylbenzene 6.8 2.3 ppb v/v 03/13/14 08:29 1,1,3-5-Trimethylbenzene ND 2.3 ppb v/v 03/13/14 08:29 1,1,2-Trichloro-1,2,2-trifluoroethane ND 2.3 ppb v/v 03/13/14 08:29 1,3,5-Trichloro-1,2,2-trifluoroethane ND 2.3 ppb v/v 03/13/14 08:29 1,3,5-Trichloro-1,2,2-trifl						* *				11.6
Toluene   32   2.3   ppb v/v   03/13/14 08:29										11.6
trans-1,3-Dichloropropene         ND         2.3         ppb v/v         03/13/14 08:29           1,2,4-Trichlorobenzene         ND         12         ppb v/v         03/13/14 08:29           1,1,1-Trichloroethane         ND         2.3         ppb v/v         03/13/14 08:29           1,1,2-Trichloroethane         ND         2.3         ppb v/v         03/13/14 08:29           Trichloroethane         ND         2.3         ppb v/v         03/13/14 08:29           Trichlorofluoromethane         ND         2.3         ppb v/v         03/13/14 08:29           1,1,2-Trichloro-1,2,2-trifluoroethane         ND         2.3         ppb v/v         03/13/14 08:29           1,2,4-Trimethylbenzene         6.8         2.3         ppb v/v         03/13/14 08:29           1,3,5-Trimethylbenzene         ND         2.3         ppb v/v         03/13/14 08:29           Vinyl chloride         ND         2.3         ppb v/v         03/13/14 08:29           Vinyl chloride         ND         2.3         ppb v/v         03/13/14 08:29           Benzene         43         7.4         ug/m3         03/13/14 08:29           Benzene         43         7.4         ug/m3         03/13/14 08:29           Carbon tetrachloride <td>· ·</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>11.6</td>	· ·									11.6
1,2,4-Trichlorobenzene         ND         12         ppb v/v         03/13/14 08:29           1,1,1-Trichloroethane         ND         2.3         ppb v/v         03/13/14 08:29           1,1,2-Trichloroethane         ND         2.3         ppb v/v         03/13/14 08:29           Trichloroethene         ND         2.3         ppb v/v         03/13/14 08:29           Trichlorofluoromethane         ND         2.3         ppb v/v         03/13/14 08:29           1,1,2-Trichloro-1,2,2-trifluoroethane         ND         2.3         ppb v/v         03/13/14 08:29           1,2,4-Trimethylbenzene         6.8         2.3         ppb v/v         03/13/14 08:29           1,3,5-Trimethylbenzene         ND         2.3         ppb v/v         03/13/14 08:29           Vinyl chloride         ND         2.3         ppb v/v         03/13/14 08:29           Vinyl chloride         ND         2.3         ppb v/v         03/13/14 08:29           Analyte         Result         Qualifier         RL         MDL         Unit         D         Prepared         Analyzed           Benzyl chloride         ND         24         ug/m3         03/13/14 08:29         03/13/14 08:29           Carbon tetrachloride         ND         <									. "	11.6
1,1,1-Trichloroethane	taraniare en en alariare en el					eddau dae				11.6
1,1,2-Trichloroethane			•							
Trichloraethene         ND         2.3         ppb v/v         03/13/14 08:29           Trichlorofluoromethane         ND         2.3         ppb v/v         03/13/14 08:29           1,1,2-Trichloro-1,2,2-trifluoroethane         ND         2.3         ppb v/v         03/13/14 08:29           1,2,4-Trimethylbenzene         6.8         2.3         ppb v/v         03/13/14 08:29           1,3,5-Trimethylbenzene         ND         2.3         ppb v/v         03/13/14 08:29           Vinyl chloride         ND         2.3         ppb v/v         03/13/14 08:29           Analyte         Result         Qualifier         RL         MDL         Unit         D         Prepared         Analyzed           Benzene         43         7.4         ug/m3         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29										11.6
Trichlorofluoromethane         ND         2.3         ppb v/v         03/13/14 08:29           1,1,2-Trichloro-1,2,2-trifluoroethane         ND         2.3         ppb v/v         03/13/14 08:29           1,2,4-Trimethylbenzene         6.8         2.3         ppb v/v         03/13/14 08:29           1,3,5-Trimethylbenzene         ND         2.3         ppb v/v         03/13/14 08:29           Vinyl chloride         ND         2.3         ppb v/v         03/13/14 08:29           Analyte         Result         Qualifier         RL         MDL         Unit         D         Prepared         Analyzed           Benzene         43         7.4         ug/m3         03/13/14 08:29           Benzyl chloride         ND         24         ug/m3         03/13/14 08:29           Beromomethane         ND         9.0         ug/m3         03/13/14 08:29           Carbon tetrachloride         ND         15         ug/m3         03/13/14 08:29           Chloroethane         ND         6.1         ug/m3         03/13/14 08:29			•							11.6
1,1,2-Trichloro-1,2,2-trifluoroethane	•					•				11.6
1,2,4-Trimethylbenzene         6.8         2.3         ppb v/v         03/13/14 08:29           1,3,5-Trimethylbenzene         ND         2.3         ppb v/v         03/13/14 08:29           Vinyl chloride         ND         2.3         ppb v/v         03/13/14 08:29           Analyte         Result         Qualifier         RL         MDL         Unit         D         Prepared         Analyzed           Benzene         43         7.4         ug/m3         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29         03/13/14 08:29	•		•						* * * * * * * * * * * * * * * * * * *	11.6
ND   2.3   ppb v/v   03/13/14 08:29		* · · · · · · · · · · · · · · · · · · ·								11.6
Vinyl chloride         ND         2.3         ppb v/v         03/13/14 08:29           Analyte         Result Benzene         43         7.4         MDL Unit ug/m3         D Prepared         Analyzed           Benzyl chloride         ND         24         ug/m3         03/13/14 08:29           Bromomethane         ND         9.0         ug/m3         03/13/14 08:29           Carbon tetrachloride         ND         15         ug/m3         03/13/14 08:29           Chlorobenzene         14         11         ug/m3         03/13/14 08:29           Chloroethane         ND         6.1         ug/m3         03/13/14 08:29	· ·								•	11.6
Analyte         Result         Qualifier         RL         MDL         Unit         D         Prepared         Analyzed           Benzene         43         7.4         ug/m3         03/13/14 08:29           Benzyl chloride         ND         24         ug/m3         03/13/14 08:29           Bromomethane         ND         9.0         ug/m3         03/13/14 08:29           Carbon tetrachloride         ND         15         ug/m3         03/13/14 08:29           Chlorobenzene         14         11         ug/m3         03/13/14 08:29           Chloroethane         ND         6.1         ug/m3         03/13/14 08:29	· · · · · · · · · · · · · · · · · · ·									11.6
Benzene         43         7.4         ug/m3         03/13/14 08:29           Benzyl chloride         ND         24         ug/m3         03/13/14 08:29           Bromomethane         ND         9.0         ug/m3         03/13/14 08:29           Carbon tetrachloride         ND         15         ug/m3         03/13/14 08:29           Chlorobenzene         14         11         ug/m3         03/13/14 08:29           Chloroethane         ND         6.1         ug/m3         03/13/14 08:29					Mari	• •	_			11.6
Benzyl chloride         ND         24         ug/m3         03/13/14 08:29           Bromomethane         ND         9.0         ug/m3         03/13/14 08:29           Carbon tetrachloride         ND         15         ug/m3         03/13/14 08:29           Chlorobenzene         14         11         ug/m3         03/13/14 08:29           Chloroethane         ND         6.1         ug/m3         03/13/14 08:29			Qualitier		MDL		<u>_</u> _	Prepared	· ———	Dil Fa
Bromomethane         ND         9.0         ug/m3         03/13/14 08:29           Carbon tetrachloride         ND         15         ug/m3         03/13/14 08:29           Chlorobenzene         14         11         ug/m3         03/13/14 08:29           Chloroethane         ND         6.1         ug/m3         03/13/14 08:29					•	=				11.6
Carbon tetrachloride         ND         15         ug/m3         03/13/14 08:29           Chlorobenzene         14         11         ug/m3         03/13/14 08:29           Chloroethane         ND         6.1         ug/m3         03/13/14 08:29										11.62
Chlorobenzene         14         11         ug/m3         03/13/14 08:29           Chloroethane         ND         6.1         ug/m3         03/13/14 08:29	*					_			1.0	11.62
Chloroethane ND 6.1 ug/m3 03/13/14 08:29										11.63
						=				11.62
_niorororm ND 11 ug/m3 03/13/14 08:29		and the second second second							the second secon	11.62
Chloromethane 20 12 ug/m3 03/13/14 08:29										11.62 11.62

TestAmerica Knoxville

Client: J.M. Waller Associates, Inc. Project/Site: Smokey Mountain Smelter

TestAmerica Job ID: 140-1006-1

Lab Sample ID: 140-1006-5

Matrix: Air

Client Sample ID: SMSSV3-10

Date Collected: 03/05/14 17:33

Date Received: 03/06/14 13:45 Sample Container: Summa Canister 1L

Analyte	Result Qualifier	RL	MDL Unit	D Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND ND	9.2	ug/m3		03/13/14 08:29	11.62
cis-1,3-Dichloropropene	ND	11	ug/m3		03/13/14 08:29	11.62
1,2-Dibromoethane (EDB)	ND	18	ug/m3		03/13/14 08:29	11.62
1,2-Dichlorobenzene	ND ·	14	ug/m3		03/13/14 08:29	11.62
1,3-Dichlorobenzene	ND	14	ug/m3		03/13/14 08:29	11,62
1,4-Dichlorobenzene	ND	. 14	ug/m3		03/13/14 08:29	11.62
Dichlorodifluoromethane	ND	11	ug/m3		03/13/14 08:29	11,62
1,1-Dichloroethane	18	9.4	ug/m3		03/13/14 08:29	11.62
1,2-Dichloroethane	22	9.4	ug/m3		03/13/14 08:29	11.62
1,1-Dichloroethene	ND	9.2	ug/m3		03/13/14 08:29	11.62
1,2-Dichloropropane	ND	11	ug/m3		03/13/14 08:29	11.62
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	16	ug/m3		03/13/14 08:29	11,62
Ethylbenzene	52	10	ug/m3		03/13/14 08:29	11.62
dexachtorobutadiene	ND	120	ug/m3		03/13/14 08:29	11.62
Methylene Chloride	40	20	ug/m3		03/13/14 08:29	11.62
m-Xylene & p-Xylene	56	10	ug/m3		03/13/14 08:29	11.62
o-Xylene	32	10	ug/m3		03/13/14 08:29	11.62
ityrene	ND -	9.9	ug/m3	:	03/13/14 08:29	11.62
,1,2,2-Tetrachloroethane	ND	16	ug/m3	¥	03/13/14 08:29	11.62
Fetrachloroethene	ND	16	ug/m3		03/13/14 08:29	11.62
Foluene .	120	8.8	ug/m3		03/13/14 08:29	11.62
rans-1,3-Dichloropropene	ND	11	ug/m3		03/13/14 08:29	11.62
,2,4-Trichlorobenzene	ND	86	ug/m3		03/13/14 08:29	11.62
,1,1-Trichloroethane	ND	13	ug/m3		03/13/14 08:29	11.62
,1,2-Trichloroethane	ND	13	ug/m3		03/13/14 08:29	11.62
richloroethene	ND	12	ug/m3	•	03/13/14 08:29	11.62
Frichlorofluoromethane	ND	13	ug/m3	1 1	03/13/14 08:29	11.62
,1,2-Trichloro-1,2,2-trifluoroethane	ND	18	ug/m3		03/13/14 08:29	11.62
,2,4-Trimethylbenzene	34	11	ug/m3		03/13/14 08:29	11.62
,3,5-Trimethylbenzene	ND	11	ug/m3		03/13/14 08:29	11.62
/inyl chloride	ND	5.9	ug/m3	-	03/13/14 08:29	11.62
Surrogate	%Recovery Qualifier	Limits		Prepared	Analyzed	Dii Fac
4-Bromofluorobenzene (Surr)	97	60 - 140		* .	03/13/14 08:29	11.62

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Client: J.M. Waller Associates, Inc. Project/Site: Smokey Mountain Smelter TestAmerica Job ID: 140-1006-1

Client Sample ID: SMSSV5-7

Date Collected: 03/05/14 17:07 Date Received: 03/06/14 13:45

Sample Container: Summa Canister 1L

Lab Sample ID: 140-1006-6

Matrix: Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Benzene	ND	-	2.0		ppb v/v			03/13/14 02:12	-
Benzyl chloride	ND	•	4.0		ppb v/v			03/13/14 02:12	
Bromomethane	ND		2.0		ppb v/v			03/13/14 02:12	: •
Carbon tetrachloride	ND		2.0		ppb v/v			03/13/14 02:12	
Chlorobenzene	ND	:	2.0		ppb v/v			03/13/14 02:12	
Chloroethane	ND		2.0		ppb v/v			03/13/14 02:12	
Chloroform	ND		2.0		ppb v/v			03/13/14 02:12	
Chloromethane	ND		5.0		ppb v/v		•	03/13/14 02:12	
cis-1,2-Dichloroethene	ND		2.0		ppb v/v			03/13/14 02:12	
cis-1,3-Dichloropropene	ND		2.0	E 4 - 1 - 1	ppb v/v			03/13/14 02:12	
1,2-Dibromoethane (EDB)	ND	*	2.0		ppb v/v			03/13/14 02:12	
1,2-Dichlorobenzene	ND		2.0		ppb v/v			03/13/14 02:12	
1,3-Dichlorobenzene	. ND		2.0		ppb v/v			03/13/14 02:12	
1,4-Dichlorobenzene	ND		2.0		ppb v/v			03/13/14 02:12	
Dichlorodifluoromethane	ND		2.0		ppb v/v			03/13/14 02:12	
1,1-Dichloroethane	ND	** * * : * : *	2.0		ppb v/v			03/13/14 02:12	٠
1.2-Dichloroethane	, ND		2.0		ppb v/v			03/13/14 02:12	
1,1-Dichloroethene	ND		2.0		ppb v/v			03/13/14 02:12	
1,2-Dichloropropane	ND		2.0		ppb v/v			03/13/14 02:12	3 July 1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND.		2.0		ppb v/v		•	03/13/14 02:12	
Ethylbenzene	ND.		2.0		ppb v/v			03/13/14 02:12	
dexachlorobutadiene	ND ND		10	÷	bbp n/n		٠	03/13/14 02:12	
Methylene Chloride	. ND		5.0		• •			03/13/14 02:12	
			2.0		ppb v/v				
n-Xylene & p-Xylene	3.1 ND				ppb v/v			03/13/14 02:12 03/13/14 02:12	
o-Xylene			2.0		ppb v/v				
Styrene	ND		2.0		ppb v/v			03/13/14 02:12	
I,1,2,2-Tetrachioroethane	ND		2.0		ppb v/v			03/13/14 02:12	
Fetrachloroethene	ND		2.0		ppb v/v			03/13/14 02:12	
Foluene	3.6		2.0		ppb v/v			03/13/14 02:12	•
rans-1,3-Dichloropropene	ND		2.0		ppb v/v			03/13/14 02:12	
I,2,4-Trichlorobenzene	ND		10		ppb v/v			03/13/14 02:12	•
1,1,1-Trichloroethane	ND		2.0		ppb v/v			03/13/14 02:12	
1,1,2-Trichloroethane	ND	•	2.0		ppb v/v			03/13/14 02:12	
Trichloroethene	ND		2.0		ppb v/v			03/13/14 02:12	
Frichlorofluoromethane	ND.		2.0		ppb v/v			03/13/14 02:12	
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2.0		ppb v/v			03/13/14 02:12	
1,2,4-Trimethylbenzene	2.7		2.0	*	ppb v/v			03/13/14 02:12	•
i,3,5-Trimethylbenzene	ND		2.0		ppb v/v			03/13/14 02:12	
/inyl chloride	· ND		2.0		ppb v/v			03/13/14 02:12	•
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		6.4		ug/m3			03/13/14 02:12	
Benzyl chloride	ND		21		ug/m3			03/13/14 02:12	
Bromomethane	ND	-	7.8	4	ug/m3			03/13/14 02:12	
Carbon tetrachloride	ND		13		ug/m3			03/13/14 02:12	
Chlorobenzene	ND		9.2		ug/m3			03/13/14 02:12	
Chloroethane	ND		5.3		ug/m3		•	03/13/14 02:12	.1
Chloroform	ND.		9.8		ug/m3			03/13/14 02:12	1
Chloromethane	. ND		10 .		ug/m3			03/13/14 02:12	. 1

TestAmerica Knoxville

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Client: J.M. Waller Associates, Inc. Project/Site: Smokey Mountain Smelter TestAmerica Job ID: 140-1006-1

Client Sample ID: SMSSV5-7

Date Collected: 03/05/14 17:07

Date Received: 03/06/14 13:45

Sample Container: Summa Canister 1L

Lab Sample ID: 140-1006-6

Matrix: Air

Analyte	Result Q	ualifler RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND -	7.9		ug/m3	<del>_</del> -		03/13/14 02:12	1
cis-1,3-Dichloropropene	ND	9.1		ug/m3			03/13/14 02:12	1
1,2-Dibromoethane (EDB)	ND	15		ug/m3			03/13/14 02:12	. 1
1,2-Dichlorobenzene	ND	12.		ug/m3			03/13/14 02:12	1
1,3-Dichlorobenzene	ND	12		ug/m3			03/13/14 02:12	1
1,4-Dichlorobenzene	· ND	. 12		ug/m3			03/13/14 02:12	1
Dichlorodifluoromethane	ND	9.9		ug/m3			03/13/14 02:12	1
1,1-Dichloroethane	ND	8.1		ug/m3			03/13/14 02:12	1
1,2-Dichloroethane	ND	8.1		ug/m3			03/13/14 02:12	1
1,1-Dichloroethene	ND	7.9		ug/m3			03/13/14 02:12	1
1,2-Dichloropropane	ND	9.2		ug/m3			03/13/14 02:12	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	14		ug/m3 :			03/13/14 02:12	1
Ethylbenzene ·	ND.	8.7		ug/m3		."	03/13/14 02:12	1
Hexachlorobutadiene	ND	110		ug/m3			03/13/14 02:12	1
Methylene Chloride	ND	17		ug/m3			03/13/14 02:12	1
m-Xylene & p-Xylene	13	8.7		ug/m3			03/13/14 02:12	1
o-Xylene	ND	8.7		ug/m3		* * * * *	03/13/14 02:12	1
Styrene	ND	8.5		ug/m3		•	03/13/14 02:12	. 1
1,1,2,2-Tetrachioroethane	ND	14		ug/m3			03/13/14 02:12	1
Tetrachloroethene	ND	. 14		ug/m3			03/13/14 02:12	1
Toluene	14	7.5		ug/m3		•	03/13/14 02:12	1
trans-1,3-Dichloropropene	ND	9.1		ug/m3			03/13/14 02:12	, 1
1,2,4-Trichlorobenzene	ND	74		ug/m3	•		03/13/14 02:12	1
1,1,1-Trichloroethane	ND	11		ug/m3			03/13/14 02:12	. 1
1,1,2-Trichloroethane	ND	11		ug/m3			03/13/14 02:12	1
Trichloroethene	ND	. 11		ug/m3			03/13/14 02:12	1
Trichlorofluoromethane	ND	11	÷	ug/m3			03/13/14 02:12	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	15		ug/m3			03/13/14 02:12	. 1
1,2,4-Trimethylbenzene	13	9.8		ug/m3			03/13/14 02:12	1
1,3,5-Trimethylbenzene	ND	9.8	÷	ug/m3			03/13/14 02:12	1
Vinyl chloride	ND	5.1		ug/m3 :			03/13/14 02:12	1
Surrogate	%Recovery Qu	alifier Limits	•			Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96	60 _ 140			_		03/13/14 02:12	

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Client: J.M. Waller Associates, Inc. Project/Site: Smokey Mountain Smelter TestAmerica Job ID: 140-1006-1

Client Sample ID: SMSSV9-10

Date Collected: 03/06/14 09:50 Date Received: 03/06/14 13:45

Sample Container: Summa Canister 1L

Lab Sample ID: 140-1006-7

Matrix: Air

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Analyte	Result	Qualifier	RL.	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Benzene	4.1		2.0		ppb v/v			03/13/14 03:06	
Benzyl chloride	ND		4.0		ppb v/v			03/13/14 03:06	
Bromomethane	ND		2.0		ppb v/v			03/13/14 03:06	
Carbon tetrachloride	ND		2.0		ppb v/v			03/13/14 03:06	
Chlorobenzene	ND		2.0		ppb v/v			03/13/14 03:06	
Chloroethane	ND		2.0		ppb v/v		_	03/13/14 03:06	
Chloroform	· ND		2.0		ppb v/v			03/13/14 03:06	
Chloromethane	ND	-	5.0		ppb v/v			03/13/14 03:06	
cis-1,2-Dichloroethene	ND.	•	2.0		ppb v/v			03/13/14 03:06	
cis-1,3-Dichloropropene	: ND		2.0		ppb v/v	•		03/13/14 03:06	
,2-Dibromoethane (EDB)	ND		2.0		ppb v/v			03/13/14 03:06	
I,2-Dichlorobenzene	ND		2.0		ppb v/v			03/13/14 03:06	
,3-Dichlorobenzene	ND		2.0	:	ppb v/v			03/13/14 03:06	
,4-Dichlorobenzene	ND		2.0		ppb v/v			03/13/14 03:06	
Dichlorodifluoromethane	ND		2.0	•	ppb v/v			03/13/14 03:06	
,1-Dichloroethane	ND		2.0		ppb v/v			03/13/14 03:06	
1,2-Dichloroethane	ND		2.0		ppb v/v			03/13/14 03:06	
,1-Dichloroethene	ND	. <del>.</del>	2.0	•	ppb v/v			03/13/14 03:06	
,2-Dichloropropane	ND		2.0		ppb v/v			03/13/14 03:06	
,2-Dichloro-1,1,2,2-tetraffuoroethane	ND.		2.0		ppb v/v			03/13/14 03:06	
Ethylbenzene	2.3		2.0		ppb v/v			03/13/14 03:06	•
lexachlorobutadiene	ND		10		ppb v/v			03/13/14 03:06	
Methylene Chloride	ND		5,0		ppb v/v			03/13/14 03:06	
n-Xylene & p-Xylene	8.8		2.0		ppb v/v			03/13/14 03:06	4.5
-Xylene	4.2		2.0		ppb v/v			03/13/14 03:06	
Styrene	ND	v*	2.0		ppb v/v			03/13/14 03:06	
,1,2,2-Tetrachloroethane	ND		2.0		ppb v/v			03/13/14 03:06	
etrachloroethene	ND		2.0		ppb v/v		•	03/13/14 03:06	
oluene	13		2.0		ppb v/v		•	03/13/14 03:06	
ans-1,3-Dichloropropene	ND		2.0		ppb v/v			03/13/14 03:06	
,2,4-Trichlorobenzene	ND		10		ppb v/v			03/13/14 03:06	
,1,1-Trichloroethane	ND		2.0		ppb v/v			03/13/14 03:06	
1,2-Trichloroethane	ND		2.0		ppb v/v			03/13/14 03:06	
richloroethene	ND		2.0		ppb v/v			03/13/14 03:06	
richlorofluoromethane	ND		2.0		ppb v/v			03/13/14 03:06	
,1,2-Trichloro-1,2,2-trifluoroethane	ND		2.0		ppb v/v		•	03/13/14 03:06	
,2,4-Trimethylbenzene	4.6		2.0	•	ppb v/v			03/13/14 03:06	
,3,5-Trimethylbenzene	ND		2.0		ppb v/v			03/13/14 03:06	
/inyl chloride	ND		2.0		ppb v/v			03/13/14 03:06	
nalyte		Qualifier	RL	· MDL	Unit	D	Prepared	Analyzed	Díl Fa
Benzene	13		6.4	<del>.</del>	ug/m3	<del></del>		03/13/14 03:06	<del></del>
Benzyl chloride	ND		21		ug/m3			03/13/14 03:06	
Iromomethane	ND		7.8		ug/m3			03/13/14 03:06	
Carbon tetrachloride	ND		13		ug/m3			03/13/14 03:06	
Chlorobenzene	ND		9.2		ug/m3			03/13/14 03:06	
Chloroethane	ND	4	5.3		ug/m3			03/13/14 03:06	
Chloroform	ND.		9.8		ug/m3			03/13/14 03:06	
Chloromethane	, ND		10		ug/m3			03/13/14 03:06	

TestAmerica Knoxville

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Client: J.M. Waller Associates, Inc. Project/Site: Smokey Mountain Smelter

TestAmerica Job ID: 140-1006-1

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Client Sample ID: SMSSV9-10

Date Collected: 03/06/14 09:50 Date Received: 03/06/14 13:45

1,3,5-Trimethylbenzene

4-Bromofluorobenzene (Surr)

Vinyl chloride

Surrogate

Sample Container: Summa Canister 1L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

NĎ

ND

%Recovery Qualifier

92

Lab Sample ID: 140-1006-7

Matrix: Air

Analyte	Resuit	Qualifier RL	MDL	Unit	D Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND	7.9		ug/m3		03/13/14 03:06	1
cis-1,3-Dichloropropene	ND	9.1		ug/m3		03/13/14 03:06	1
1,2-Dibromoethane (EDB)	NĎ	15		ug/m3		03/13/14 03:06	1
1,2-Dichlorobenzene	ND	12		ug/m3		03/13/14 03:06	1
1,3-Dichlorobenzene	ND	12	•	ug/m3		03/13/14 03:06	1
1,4-Dichlorobenzene	ND	12		ug/m3		03/13/14 03:06	1
Dichlorodifluoromethane	ND	9.9		ug/m3		03/13/14 03:06	1
1,1-Dichloroethane	ND	8.1		ug/m3		03/13/14 03:06	1
1,2-Dichloroethane	ND	8.1		ug/m3		03/13/14 03:06	1
1,1-Dichloroethene	ND	7.9		ug/m3		03/13/14 03:06	1
1,2-Dichloropropane	ND	9.2		ug/m3		03/13/14 03:06	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	14		ug/m3		03/13/14 03:06	1
Ethylbenzene	10	8.7	•	ug/m3		03/13/14 03:06	1
Hexachlorobutadiene	. ND	110		ug/m3		03/13/14 03:06	1
Methylene Chloride	ND	17		ug/m3		03/13/14 03:06	1
m-Xylene & p-Xylene	38	8.7		ug/m3		03/13/14 03:06	1
o-Xylene	18	8.7		ug/m3		03/13/14 03:06	1
Styrene	NĎ	8.5	-	ug/m3		03/13/14 03:06	1
1,1,2,2-Tetrachtoroethane	ND	. 14		ug/m3		03/13/14 03:06	1
Tetrachloroethene	NĎ	14	•	ug/m3		03/13/14 03:06	1
Toluene	47	7.5		ug/m3		03/13/14 03:06	1
trans-1,3-Dichloropropene	ND	9.1		ug/m3		03/13/14 03:06	1
1,2,4-Trichlorobenzene	ND	74		ug/m3		03/13/14 03:06	1
1,1,1-Trichloroethane	ND	. 11		ug/m3		03/13/14 03:06	1
1,1,2-Trichloroethane	ND	. 11	•	ug/m3		03/13/14 03:06	1
Trichloroethene	' ND	. 11		ug/m3		03/13/14 03:06	1 -
Trichlorofluoromethane	ND	11		ug/m3		03/13/14 03:06	1
1,1,2-Trichloro-1,2,2-triffuoroethane	ND	15		ug/m3		03/13/14 03:06	1
1,2,4-Trimethylbenzene	23	9.8		ug/m3		03/13/14 03:06	1

9.8

5.1

Limits

60 - 140

ug/m3

ug/m3

03/13/14 03:06

03/13/14 03:06

Analyzed

03/13/14 03:06

Prepared

Dil Fac

Client: J.M. Waller Associates, Inc. Project/Site: Smokey Mountain Smelter

TestAmerica Job ID: 140-1006-1

Client Sample ID: SMSSV4-15

Date Collected: 03/06/14 10:25

Lab Sample ID: 140-1006-8

Matrix: Air

Date Received: 03/06/14 13:45

Sample Container: Summa Canister 1L

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	6.7		2.0		ppb v/v			03/13/14 04:00	1.2
Benzyl chloride	ND		4.0		pob v/v			03/13/14 04:00	1.29
Bromomethane	ND		2.0		ppb v/v			03/13/14 04:00	1.2
Carbon tetrachloride	ND		2.0		ppb v/v			03/13/14 04:00	1.2
Chlorobenzene	ND		2.0		ppb v/v			03/13/14 04:00	1.25
Chloroethane	ND		2.0		ppb v/v			03/13/14 04:00	1.2
Chloroform	ND	-	2.0		ppb v/v			03/13/14 04:00	1.25
Chloromethane	ND		5.0		ppb v/v			03/13/14 04:00	1.25
cis-1,2-Dichloroethene	ND		2.0		ppb v/v	_		03/13/14 04:00	1.2
cis-1,3-Dichloropropene	ND		2.0		ppb v/v			03/13/14 04:00	1,2
1,2-Dibromoethane (EDB)	ND		2.0		ppb v/v			03/13/14 04:00	1.25
1,2-Dichlorobenzene	ND		2.0		ppb v/v			03/13/14 04:00	1,2
1,3-Dichlorobenzene	ND:			100	ppb v/v		· .	03/13/14 04:00	1.25
			2.0		• •			•	
1,4-Dichlorobenzene	ND:	,	2.0		ppb v/v			03/13/14 04:00 03/13/14 04:00	1.25
Dichlorodifluoromethane	ND ND		2.0		ppb v/v				1.25
1,1-Dichloroethane	ND	•	2.0		ppb v/v			03/13/14 04:00	1.25
1,2-Dichloroethane	ND		2.0		ppb v/v			03/13/14 04:00	1.25
1,1-Dichloroethene	ND		2.0		ppb v/v		.•	03/13/14 04:00	1.25
1,2-Dichloropropane	ND:		2.0	1 -	Ppb v/v			03/13/14 04:00	1,25
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.0		ppb v/v			03/13/14 04:00	1.25
Ethylbenzene	11		2.0		ppb v/v			03/13/14 04:00	1.25
Hexachlorobutadiene	ND		10		ppb v/v			03/13/14 04:00	1.25
Methylene Chloride	ND	•	5.0		ppb v/v			03/13/14 04:00	1.25
m-Xylene & p-Xylene	29		2.0		ppb v/v			03/13/14 04:00	1.25
o-Xylene	. 11		2.0		ppb v/v			03/13/14 04:00	1.25
Styrene	ND		2.0		ppb v/v			03/13/14 04:00	1.25
1,1,2,2-Tetrachloroethane	ND		2.0		ppb v/v			03/13/14 04:00	1.25
Tetrachloroethene	ND	•	2.0		ppb v/v			03/13/14 04:00	1.25
Toluene	30		2.0		ppb v/v			03/13/14 04:00	1.25
trans-1,3-Dichloropropene	. ND		2.0	*	ppb v/v			03/13/14 04:00	1.25
1,2,4-Trichlorobenzene	ND	****	10		ppb v/v			03/13/14 04:00	1.25
1,1,1-Trichloroethane	ND		2.0	-	ppb v/v			03/13/14 04:00	1.25
1,1,2-Trichloroethane	ND.		2.0		ppb v/v			03/13/14 04:00	1.25
Trichtoroethene	ND	Taria -	2.0		ppb v/v			03/13/14 04:00	1.25
Trichlorofluoromethane	ND		2.0		ppb v/v			03/13/14 04:00	1.25
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2.0		ppb v/v			03/13/14 04:00	1.25
1,2,4-Trimethylbenzene	11		2.0	177, 11	ppb v/v			03/13/14 04:00	1.25
1,3,5-Trimethylbenzene	2.7		2.0		ppb v/v		•	03/13/14 04:00	1.25
Vinyl chloride	ND	,	2.0	•	ppb v/v			03/13/14 04:00	1,25
·		<b>A</b>		.ap.		_			
Analyte		Qualifier	RL -	MDL	Unit	_ <u>D</u> _	Prepared	Analyzed	Dii Fac
Benzene	21	•	6.4	. :	ug/m3			03/13/14 04:00	1.25
Benzyl chloride	ND	_	21		ug/m3			03/13/14 04:00	1.25
Bromomethane	ND		7.8		ug/m3			03/13/14 04:00	1.25
Carbon tetrachloride	ND		13		ug/m3			03/13/14 04:00	1.25
Chlorobenzene	ND		9.2		ug/m3			03/13/14 04:00	1.25
Chloroethane	ND		5.3		ug/m3			03/13/14 04:00	1,25
Chloroform	ИD		9.8		ug/m3			03/13/14 04:00	1.25
Chloromethane	ND		10		ug/m3			03/13/14 04:00	1.25

TestAmerica Knoxville

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# **Client Sample Results**

Client: J.M. Waller Associates, Inc. Project/Site: Smokey Mountain Smelter

TestAmerica Job ID: 140-1006-1

Client Sample ID: SMSSV4-15

Date Collected: 03/06/14 10:25

Date Received: 03/06/14 13:45

Sample Container: Summa Canister 1L

Lab Sample ID: 140-1006-8

Matrix: Air

Analyte	Result	Qualifier	RL	MDL	Unit	D.	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		7.9		ug/m3			03/13/14 04:00	1.25
cis-1,3-Dichloropropene	ND		9.1		ug/m3			03/13/14 04:00	1.25
1,2-Dibromoethane (EDB)	ND		15		ug/m3			03/13/14 04:00	1.25
1,2-Dichlorobenzene	ND		12		.ug/m3			03/13/14 04:00	1.25
1,3-Dichlorobenzene	ND		12		ug/m3			03/13/14 04:00	1.25
1,4-Dichlorobenzene	ND		12	•	ug/m3			03/13/14 04:00	1.25
Dichlorodifluoromethane	ND	* .	9.9		ug/m3			03/13/14 04:00	1.25
1,1-Dichloroethane	ND		8.1		ug/m3			03/13/14 04:00	1.25
1,2-Dichloroethane	ND		8.1		ug/m3			03/13/14 04:00	1.25
1,1-Dichloroethene	ND		7.9		ug/m3			03/13/14 04:00	1.25
1,2-Dichloropropane	ND		9.2		ug/m3			03/13/14 04:00	1.25
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	14	14		ug/m3			03/13/14 04:00	1.25
Ethylbenzene	48	•	8.7		ug/m3			03/13/14 04:00	1.25
Hexachlorobutadiene	ND		110		ug/m3			03/13/14 04:00	1.25
Methylene Chioride	ND		17		ug/m3			03/13/14 04:00	1.25
m-Xylene & p-Xylene	130		8.7		ug/m3			03/13/14 04:00	1.25
o-Xylene	47		8.7		ug/m3			03/13/14 04:00	1.25
Styrene	ND		8.5		ug/m3			03/13/14 04:00	1.25
1,1,2,2-Tetrachloroethane	ND		14		ug/m3			03/13/14 04:00	1.25
Tetrachloroethene	ND		14		ug/m3		·	03/13/14 04:00	1.25
Toluene	110		7.5		ug/m3			03/13/14 04:00	1.25
trans-1,3-Dichloropropene	ND		9.1		ug/m3			03/13/14 04:00	1.25
1,2,4-Trichlorobenzene	ND		74		ug/m3			03/13/14 04:00	1.25
1,1,1-Trichloroethane	ND		11	1.	ug/m3			03/13/14 04:00	1.25
1,1,2-Trichloroethane	ND	1 1	11		ug/m3			03/13/14 04:00	1.25
Trichloroethene	ND		11		ug/m3			03/13/14 04:00	1.25
Trichlorofluoromethane	ND [*]		11		ug/m3			03/13/14 04:00	1.25
1,1,2-Trichloro-1,2,2-trifluoroethane	ND .		15		ug/m3			03/13/14 04:00	1,25
1,2,4-Trimethylbenzene	56		9.8		ug/m3			03/13/14 04:00	1.25
1,3,5-Trimethylbenzene	14		9.8		ug/m3			03/13/14 04:00	1.25
Vinyl chloride	ND	· .	5.1		ug/m3			03/13/14 04:00	1.25
Surrogate	%Recovery	Qualifier L	imits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99	- 6	0 - 140			_		03/13/14 04:00	1.25

### **Client Sample Results**

Client: J.M. Waller Associates, Inc. Project/Site: Smokey Mountain Smelter

TestAmerica Job ID: 140-1006-1

Client Sample ID: SMSSV6-5

Date Collected: 03/06/14 10:50 Date Received: 03/06/14 13:45

Chloroethane

Chloromethane

Chloroform

Lab Sample ID: 140-1006-9

Matrix: Air

Sample Container: Summa Canister 1L

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil F
Benzene	ND		1.8		ppb v/v			03/13/14 04:54	
Benzyl chloride	ND		3.6		ppb v/v			03/13/14 04:54	
Bromomethane	ND	. 1	1.8		ppb v/v			03/13/14 04:54	
Carbon tetrachloride	ND		1.8		ppb v/v			03/13/14 04:54	
Chlorobenzene	ND	•	1.8		ppb v/v			03/13/14 04:54	
Chloroethane	ND		1.8		ppb v/v			03/13/14 04:54	
Chleroform	ND		1.8		ppb v/v			03/13/14 04:54	
Chloromethane	ND		4.5		ppb v/v			03/13/14 04:54	
cis-1,2-Dichloroethene	ND		1.8		ppb v/v			03/13/14 04:54	
cis-1,3-Dichloropropene	ND	-1	1.8		ppb v/v			03/13/14 04:54	
1,2-Dibromoethane (EDB)	, ND		1.8		ppb v/v		•	03/13/14 04:54	
1,2-Dichlorobenzene	, ND		1.8		ppb v/v			03/13/14 04:54	
1,3-Dichlorobenzene	NÖ	4	1.8	* *	ppb v/v			03/13/14 04:54	
1,4-Dichlorobenzene	ND		1.8		ppb v/v			03/13/14 04:54	
Dichlorodifluoromethane	ND		1.8		ppb v/v			03/13/14 04:54	
1,1-Dichloroethane			1.8		ppb v/v			03/13/14 04:54	
1,2-Dichloroethane	ND		1.8		ppb v/v			03/13/14 04:54	
1,1-Dichloroethene	ND		1.8		ppb v/v			03/13/14 04:54	
I,2-Dichloropropane	ND		1.8		ppb v/v			03/13/14 04:54	
,2-Dichloro-1,1,2,2-tetraffuoroethane	ND		1.8		ppb v/v			03/13/14 04:54	
Ethylbenzene	ND		1.8		ppb v/v			03/13/14 04:54	
lexachiorobutadiene	ND		9.1		ppb v/v			03/13/14 04:54	
Methylene Chloride	ND	· '	4.5		ppb v/v		:	03/13/14 04:54	
n-Xylene & p-Xylene	5.7		1.8		ppb v/v			03/13/14 04:54	
-Xylene	2.4		1.8	and the second second	ppb v/v			03/13/14 04:54	
Styrene	ND.		1.8		ppb v/v			03/13/14 04:54	
I,1,2,2-Tetrachloroethane	ND		1.8		ppb v/v			03/13/14 04:54	
Fetrachloroethene	ND		1.8		ppb v/v			03/13/14 04:54	
· ·	2.9		1.8					03/13/14 04:54	
Oluene	ND				ppb v/v			03/13/14 04:54	
rans-1,3-Dichloropropene			1.8		ppb v/v			03/13/14 04:54	
,2,4-Trichtorobenzene	ND	,	9.1		ppb v/v				
,1,1-Trichloroethane	ND		1.8	-	ppb v/v			03/13/14 04:54	
,1,2-Trichloroethane	ND		1.8		ppb v/v			03/13/14 04:54	
richlorgethene	. ND		1.8		ppb v/v			03/13/14 04:54	
richlorofluoromethane	ND		1.8		ppb v/v			03/13/14 04:54	
,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.8		ppb v/v			03/13/14 04:54	
,2,4-Trimethylbenzene	2.6	•	1.8		ppb v/v			03/13/14 04:54	
,3,5-Trimethylbenzene	ND		1.8		ppb v/v			03/13/14 04:54	
/inyl chloride	ND	•	1.8		ppb v/v			03/13/14 04:54	
nalyte		Qualifier	RL	MDL		_ <u>D</u> _	Prepared	Analyzed	Dil I
enzene	ND		5.8		ug/m3			03/13/14 04:54	
enzyl chloride	ŇD		19	1	ug/m3			03/13/14 04:54	
romomethane	ND		7.1		ug/m3			03/13/14 04:54	
arbon tetrachloride	ND.		11		ug/m3			03/13/14 04:54	
Chlorobenzene	ND		8.4		ug/m3			03/13/14 04:54	

TestAmerica Knoxville

03/13/14 04:54

03/13/14 04:54

03/13/14 04:54

4.8

8.9

9.4

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# **Client Sample Results**

Client: J.M. Waller Associates, Inc. Project/Site: Smokey Mountain Smelter TestAmerica Job ID: 140-1006-1

Client Sample ID: SMSSV6-5

Date Collected: 03/06/14 10:50 Date Received: 03/06/14 13:45

Sample Container: Summa Canister 1L

Lab Sample ID: 140-1006-9

Matrix: Air

Analyte	Result Qua	lifier RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND	7.2		ug/m3			03/13/14 04:54	1
cis-1,3-Dichloropropene	ND	8.3		ug/m3			03/13/14 04:54	1
1,2-Dibromoethane (EDB)	ND	14		ug/m3	-		03/13/14 04:54	1
1,2-Dichlorobenzene	ND	11		ug/m3			03/13/14 04:54	1
1,3-Dichlorobenzene	ND	11	•	ug/m3			03/13/14 04:54	1
1,4-Dichlorobenzene	. ND	11,		ug/m3			03/13/14 04:54	1
Dichlorodifluoromethane	ND	9.0	*	ug/m3			03/13/14 04:54	1
1,1-Dichloroethane	ND	7.4		ug/m3			03/13/14 04:54	1
1,2-Dichloroethane	ND	7.4		ug/m3			03/13/14 04:54	1
1,1-Dichloroethene	ND	7.2		ug/m3 ,		•	03/13/14 04:54	1
1,2-Dichloropropane	ND	8.4	•	ug/m3			03/13/14 04:54	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	13		ug/m3			03/13/14 04:54	' 1
Ethylbenzene	ND	7.9		ug/m3			03/13/14 04:54	1
Hexachlorobutadiene	ND.	· 97		ug/m3			03/13/14 04:54	1
Methylene Chioride	ND	· 16		ug/m3		•	03/13/14 04:54	1
m-Xylene & p-Xylene	25	7.9		ug/m3			03/13/14 04:54	1
o-Xylene	10	7.9		ug/m3			03/13/14 04:54	1
Styrene	ND	7.7		ug/m3			03/13/14 04:54	1
1,1,2,2-Tetrachioroethane	ND	12	1.	ug/m3	-		03/13/14 04:54	1
Tetrachloroethene	ND	12		ug/m3			03/13/14 04:54	1
Toluene	11	6.9		ug/m3			03/13/14 04:54	1
trans-1,3-Dichloropropene	ND	8.3		ug/m3			03/13/14 04:54	1
1,2,4-Trichlorobenzene	ND	67		ug/m3	•		03/13/14 04:54	1
1,1,1-Trichloroethane	ND	9.9		ug/m3			03/13/14 04:54	1
1,1,2-Trichloroethane	ND	9.9		ug/m3			03/13/14 04:54	1
Trichloroethene	ND	9.8		ug/m3			03/13/14 04:54	1
Trichlorofluoromethane	ND	10		ug/m3			03/13/14 04:54	_ 1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	14		ug/m3			03/13/14 04:54	1
1,2,4-Trimethylbenzene	13	8.9		ug/m3			03/13/14 04:54	1
1,3,5-Trimethylbenzene	ND	8.9		ug/m3			03/13/14 04:54	1
/inyl chloride	ND	4.6		ug/m3			03/13/14 04:54	1
Surrogate	%Recovery Qual	ifier Limits	+ 1			Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	94	60 - 140			_		03/13/14 04:54	1

# **Client Sample Results**

Client: J.M. Waller Associates, Inc. Project/Site: Smokey Mountain Smelter

TestAmerica Job ID: 140-1006-1

Client Sample ID: SMSSV7-3

Date Collected: 03/06/14 11:25 Date Received: 03/06/14 13:45

Sample Container: Summa Canister 1L

Lab Sample ID: 140-1006-10

Matrix: Air

Analyte	Result	Qualifier	RL	MDL	Unit	. <u>D</u> .	Prepared	Analyzed	Dil Fac
Benzene	ND		3.6		ppb v/v			03/13/14 05:48	1
Benzyl chloride	ND	·	7.3		ppb v/v			03/13/14 05:48	1
Bromomethane	ND		3.6		ppb v/v			03/13/14 05:48	. 1
Carbon tetrachloride	ND		3.6	ete i e e e Grand	ppb v/v			03/13/14 05:48	1
Chlorobenzene	ND		3.6		ppb v/v			03/13/14 05:48	1
Chloroethane	ND	•	3.6		ppb v/v			03/13/14 05:48	1
Chloroform	ND		3.6		ppb v/v			03/13/14 05:48	1
Chloromethane	ND		9.1		ppb v/v			03/13/14 05:48	1
cis-1,2-Dichloroethene	ND		3.6		ppb v/v			03/13/14 05:48	1
cis-1,3-Dichloropropene	ND		3.6		ppb v/v			03/13/14 05:48	1
1,2-Dibromoethane (EDB)	ND		3.6		ppb v/v			03/13/14 05:48	1
1,2-Dichlorobenzene	ND	•	3.6		ppb v/v			03/13/14 05:48	1
1,3-Dichlorobenzene	ND		3.6		ppb v/v		•	03/13/14 05:48	1
1,4-Dichlorobenzene	ND	•	3.6		ppb v/v			03/13/14 05:48	. 1
Dichlorodifluoromethane	ND		3.6		ppb v/v			03/13/14 05:48	1
Tanana and an analysis of the same of the same	ND		3.6		ppb v/v			03/13/14 05:48	
1,1-Dichloroethane	ND	•	3.6		ppb v/v			03/13/14 05:48	1
1,2-Dichloroethane			3.6					03/13/14 05:48	
1,1-Dichloroethene	ND	,		, G	ppb v/v			03/13/14 05:48	
1,2-Dichloropropane	· ND	•	3.6		ppb v/v			03/13/14 05:48	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		3.6		ppb v/v			03/13/14 05:48	
Ethylbenzene	, ND		3.6		ppb v/v				
Hexachlorobutadiene	ND		18	, :	ppb v/v			03/13/14 05:48	
Methylene Chloride	ŃD	•	9.1		ppb v/v			03/13/14 05:48	
m-Xylene & p-Xylene	5.3		3.6		ppb v/v			03/13/14 05:48	
p-Xylene	ND		3.6		ppb v/v			03/13/14 05:48	
Styrene	ND	•	3.6		ppb v/v			03/13/14 05:48	1
1,1,2,2-Tetrachloroethane	ND	. *	3.6		ppb v/v		. 1	03/13/14 05:48	1
Tetrachlorcethene	ND		3.6		bbp n/n			03/13/14 05:48	•
Toluene	3.7	*	3.6		ppb v/v			03/13/14 05:48	•
trans-1,3-Dichloropropene	ND		3.6		ppb v/v			03/13/14 05:48	
1,2,4-Trichlorobenzene	ND		18		ppb v/v			03/13/14 05:48	•
1,1,1-Trichloroethane	ND	•	3.6		ppb v/v			03/13/14 05:48	•
1,1,2-Trichloroethane	ND	•	3.6		ppb v/v			03/13/14 05:48	•
Trichloroethene	ND	•	3.6		ppb v/v			03/13/14 05:48	•
Trichlorofluoromethane	ND		3.6		ppb v/v.			03/13/14 05:48	
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		3.6		ppb v/v			03/13/14 05:48	•
1,2,4-Trimethylbenzene	4.5		3.6		ppb v/v			03/13/14 05:48	•
1,3,5-Trimethylbenzene	ND	•	3.6		ppb v/v			03/13/14 05:48	
Vinyl chloride	ND		3.6		ppb v/v			03/13/14 05:48	•
		Qualifier	RL	MDL		D	Prepared	Analyzed	Dil Fa
Analyte	ND		12		ug/m3	· <u>-</u> ·	Troparou	03/13/14 05:48	
Benzene					ug/m3			03/13/14 05:48	•
Benzyl chloride	ЙD		38					03/13/14 05:48	
Bromomethane	ND		14		ug/m3			03/13/14 05:48	
Carbon tetrachloride	ND		23		ug/m3 .				
Chlorobenzene	ND		17		ug/m3			03/13/14 05:48	
Chloroethane	ND	=	9.6		ug/m3 ug/m3			03/13/14 05:48 03/13/14 05:48	
Chloroform	ND		18						

TestAmerica Knoxville

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# **Client Sample Results**

Client: J.M. Waller Associates, Inc. Project/Site: Smokey Mountain Smelter

TestAmerica Job ID: 140-1006-1

Client Sample ID: SMSSV7-3

Date Collected: 03/06/14 11:25

Date Received: 03/06/14 13:45

Sample Container: Summa Canister 1L

Lab Sample ID: 140-1006-10

Matrix: Air

Analyte	Resuit	Qualifier		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND			14		ug/m3			03/13/14 05:48	1
cis-1,3-Dichloropropene	ND			17		ug/m3			. 03/13/14 05:48	1
1,2-Dibromoethaле (EDB).	ND			28	·:	ug/m3			03/13/14 05:48	1
1,2-Dichlorobenzene	ND			22		ug/m3			03/13/14 05:48	· 1
1,3-Dichlorobenzene	ND			22		ug/m3			03/13/14 05:48	1
1,4-Dichlorobenzene	ND			22		ug/m3			03/13/14 05:48	1
Dichlorodifluoromethane	ND			18		ug/m3			03/13/14 05:48	1
1,1-Dichloroethane	ND			15	1	ug/m3			03/13/14 05:48	1
1,2-Dichloroethane	ND			15		ug/m3			03/13/14 05:48	1
1,1-Dichloroethene	ND			14		ug/m3			03/13/14 05:48	1
1,2-Dichloropropane	ND		•	. 17		ug/m3		•	03/13/14 05:48	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND			25		ug/m3		'	03/13/14 05:48	1
Ethylbenzene	ND			16		ug/m3			03/13/14 05:48	. 1
Hexachlorobutadiene	ND			190	.*	ug/m3			03/13/14 05:48	1
Methylene Chloride	ND	•		32		ug/m3			03/13/14 05:48	1
m-Xylene & p-Xylene	23			16		ug/m3			03/13/14 05:48	1
o-Xylene	ND			16		ug/m3			03/13/14 05:48	1
Styrene	ND			15	200	ug/m3			03/13/14 05:48	1
1,1,2,2-Tetrachloroethane	ND.			25	• •	ug/m3			03/13/14 05:48	1
Tetrachloroethene	ND	•		25		ug/m3		•	03/13/14 05:48	1
Toluene	14			14		ug/m3			03/13/14 05:48	1
trans-1,3-Dichloropropene	ND			17		ug/m3			03/13/14 05:48	1
1,2,4-Trichlorobenzene	ND			130		ug/m3			03/13/14 05:48	1
1,1,1-Trichloroethane	ND			20		ug/m3			03/13/14 05:48	1
1,1,2-Trichloroethane	NĐ			20	•	ug/m3			03/13/14 05:48	1
Trichloroethene	ND		÷	20		ug/m3			03/13/14 05:48	· 1
Trichlorofluoromethane	ND			20		ug/m3			03/13/14 05:48	· 1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND :			28	ė.	ug/m3		•	03/13/14 05:48	1
1,2,4-Trimethylbenzene	22	•		18		ug/m3	•		03/13/14 05:48	1
1,3,5-Trimethylbenzene	ND			18		ug/m3			03/13/14 05:48	1
Vinyl chloride	ND		j.	9.3	•	ug/m3			03/13/14 05:48	1
Surrogate	%Recovery	Qualifier	Limit	s				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	94		60 - 1	40			-		03/13/14 05:48	

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### Keller, Michael E.

From:

Goddard, Denise

Sent:

Wednesday, May 21, 2014 9:40 AM

To: Cc: Keller, Michael E. Goddard, Denise

Subject:

FW: Smokey Mountain Smelters (14-0103) - TO-15 soil gas samples questions

Michael..... A reference sample was collected at sample location SMSSV8 at 15 feet....Denise

From: Austin, Janice [mailto:janice.austin@jmwaller.com]

Sent: Wednesday, May 21, 2014 9:34 AM

To: Goddard, Denise

Cc: Keller, Michael E.; Kestle, Rusty

Subject: RE: Smokey Mountain Smelters (14-0103) - TO-15 soil gas samples questions

Good morning,

A reference sample was collected at sample location SMSSV8 at 15 feet.

Please feel free to contact me should you have any additional questions.

Thanks,

#### Janice D. Austin, P.E.

**Project Manager** 

J. M. Waller Associates Inc.

Tel: 404.443.2777 Ext.: 4030 | Celi: 904.248.1247

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Atlanta, Georgia 30354-1390

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From: Goddard, Denise [mailto:Goddard.Denise@epa.gov]

Sent: Tuesday, May 20, 2014 1:57 PM

To: Austin, Janice

Cc: Keller, Michael E.; Kestle, Rusty; Goddard, Denise

Subject: RE: Smokey Mountain Smelters (14-0103) - TO-15 soil gas samples questions

Janice.....One last question. Was a control sample collected as part of this data set? Thanks....Denise

From: Austin, Janice [mailto:janice.austin@jmwaller.com]

Sent: Tuesday, May 20, 2014 12:34 PM

To: Goddard, Denise

Cc: Keller, Michael E.; Kestle, Rusty

Subject: RE: Smokey Mountain Smelters (14-0103) - TO-15 soil gas samples questions

#### Denise,

I have attached the data package which contains the rinseate blank sample. Yes, the rinseate blank did not include the PE tubing. The change to PE tubing was made in the field at the direction of the RPM, Rusty Kestle. I will ensure to provide the clarification for collection of the duplicate sample.

Please feel free to let me know if you need anything further.

Thanks,

Janice D. Austin, P.E. Project Manager

J. M. Waller Associates Inc.

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From: Goddard, Denise [mailto:Goddard.Denise@epa.gov]

Sent: Tuesday, May 20, 2014 11:36 AM

To: Austin, Janice

Cc: Keller, Michael E.; Kestle, Rusty

Subject: RE: Smokey Mountain Smelters (14-0103) - TO-15 soil gas samples questions

Janice.....Just a few more questions for clarification. Can you send me the results of the rinseate blank and am I to assume that the rinseate blamk, based on your discussion below, did not include the PE tubing? Because if the PE tubing came in contact with the soil vapor, the tubing should have been included as part of the rinseate blank. Without the tubing being a part of the rinseate blank sample, how do we know that the tubing isn't contributing to the positive results detected in the samples?

Also, it appears that the duplicate sample wasn't collected exactly as specified in the SOP (which required a tee connected to the tubing that would allow simultaneous filling of two canisters)......Thanks....Denise

From: Austin, Janice [mailto:janice.austin@jmwaller.com]

Sent: Tuesday, May 20, 2014 11:14 AM

To: Goddard, Denise

Cc: Keller, Michael E.; Kestle, Rusty

Subject: RE: Smokey Mountain Smelters (14-0103) - TO-15 soil gas samples questions

A duplicate sample was collected at location SMSSV02. An equipment blank was not collected on the SUMMA canister as Test America was providing a batch certification for the cleanliness of the canisters. An equipment rinseate blank for the DPT PRT system was collected and submitted for analysis of VOAs and SVOAs by the CLP laboratory. A rinseate blank was not performed on the PE tubing that was used.

The samples are being collected in support of the HHRA for the RI to determine if there is a migration pathway of soil gas from the wastes consolidated onsite within the capped former waste pile and if there is any impacts to groundwater or neighboring properties. There are no buildings onsite. As a result, soil gas samples were collected and the data screened against the Vapor Intrusion Screening Levels. Of the analytes which exceeded the VISL, groundwater data for

those analytes were evaluated and screened against the target groundwater concentration and the MCL. Based on the current data set, none of the analytes which exceeded the VISL from the soil gas samples exceeded the target groundwater concentration or the MCL in the dissolved phase. However, analytes were detected within the soil gas samples collected 100 feet from neighboring residential property. As a result, JM Waller will collect time-weighted soil gas samples from the residential property in June 2014.

Janice D. Austin, P.E. Project Manager

J. M. Waller Associates Inc.

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From: Goddard, Denise [mailto:Goddard,Denise@epa.gov]

Sent: Tuesday, May 20, 2014 9:36 AM

**To:** Austin, Janice; Kestle, Rusty **Cc:** Keller, Michael E.; Goddard, Denise; Kestle, Rusty

Subject: RE: Smokey Mountain Smelters (14-0103) - TO-15 soil gas samples questions

Janice.....Were any QC samples collected as specified in Section 2.4 of the SOP? Also, what is the soil gas data being used for (what type of decisions will be made based on this data)? Is the soil gas data being compared to some kind of screening values / levels if so, what specific screening values are being used? Thanks....Denise

From: Austin, Janice [mailto:janice.austin@jmwaller.com]

Sent: Tuesday, May 20, 2014 9:06 AM

To: Kestle, Rusty

Cc: Keller, Michael E.; Goddard, Denise

Subject: RE: Smokey Mountain Smelters (14-0103) - TO-15 soil gas samples questions

Good morning,

In response to the additional concerns regarding the sample collection method, JM Waller offers the following comments. Please feel free to contact me should you have any additional concerns.

All samples were collected in accordance with the SESD SOP Soil Gas Sampling (SESDPROC-307-R2). The soil gas sampling was completed using the GeoProbe Post Run Tubing (PRT) method. The PRT soil vapor collection apparatus consisted of an expendable point which was placed in the end of DPT rods loosely within an internally threaded point holder. After the rods were pushed to the desired depth, they were retracted a few inches to expose the unsaturated soil and a threaded adapter was attached to tubing, inserted into the rods, and by twisting the tubing was threaded into the point holder down-hole. The sample was drawn through the point holder, through the adapter, and into the sample tubing. Thus eliminating contact between the sample and the inside of the rods.

At each location the rods were pushed to an appropriate depth and an area around the top of the rods was dug out and filled with granular bentonite which was then hydrated (Section 3.2, SESDPROC-307-R2). After the sampling device was deployed the tubing was purged using a syringe. The minimum purge volume of gas removed was determined as three times the tubing volume (Section 5, paragraph 1, SESDPROC-307-R2). A summary of the purge volume is provided in the table below. After purging, the tubing was attached to a RAE systems photoionization detector (PID) and allowed to

equilibrate. Stable PID readings were recorded (see tabular summary below). The tubing was sealed by kinking immediately above the PID instrument. The integrity of the seal was tested using the PID pump alarm, and the tubing was attached to a SUMMA canister and unsealed. A grab sample was collected by releasing the vacuum in the canister. Soil vapor sample details are summarized in the table below. A vacuum/pressure gauge was not utilized as the samples were collected as a discrete sample and not a time weighted sample as specified in Section 5, paragraph 2 of the SESD SOP Soil Gas Sampling (SESDPROC-307-R2). Tubing used for soil vapor sample collection was originally planned to be Teflon in accordance with SESD SOP, however while attempting to thread the adapter on the point holder at sample location SMSSV8, it was discovered that Teflon tubing did not have the rigidity to thread the adapter into the point holder and with the approval of the EPA RPM (Rusty Kestle) in the field, ¼-inch inner diameter polyethylene tubing was used. However, an equipment blank on the tubing was not performed in the field.

Soil Vaper Location	Date	Time	Depth (feet bls)	Purge Volume (mL)	PID Reading (ppm)
SMSSV8	3/5/14	1505	15	660	1.1
SMSSV1	3/5/14	1550	5	300	0.8
SMSSV2	3/5/14	1611	10	600	1.1
SMSSV5	3/5/14	1710	7	540	1.0
SMSSV3	3/5/14	1740	10	660	1.0
SMSSV9	3/6/14	0950	10	540	0.9
SMSSV9	3/6/14	1025	15	900	1.9
SMSSV6	3/6/14	1050	5	360	1.0
SMSSV7	3/6/14	1125	3	420	8.0

# Janice D. Austin, P.E. Project Manager

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From: Kestle, Rusty [mailto:Kestle.Rusty@epa.gov]

Sent: Monday, May 19, 2014 9:34 AM

To: Austin, Janice

Cc: Keller, Michael E.; Goddard, Denise

Subject: RE: Smokey Mountain Smelters (14-0103) - TO-15 soil gas samples questions

Janice,

Please see the attached comments; we may need to have a conference call to discuss. Thanks!

Rusty

W. Russell Kestle, Jr.

Registered Professional Geologist (GA)

Senior Remedial Project Manager

Section C, Superfund Remedial Branch, Superfund Division

U.S. Environmental Protection Agency, Region 4

11th Floor 61 Forsyth Street, S.W. Atlanta, GA 30303-8909 Telephone: (404) 562-8819

From: Goddard, Denise

Sent: Monday, May 19, 2014 9:19 AM

To: Kestle, Rusty

Cc: Goddard, Denise; Keller, Michael E.

Subject: FW: Smokey Mountain Smelters (14-0103) - TO-15 soil gas samples questions

Rusty.....Can you forward this email to Janice for a response?? Thanks....Denise

From: Keller, Michael E.

Sent: Friday, May 16, 2014 9:19 AM

To: Goddard, Denise

Subject: RE: Smokey Mountain Smelters (14-0103) - TO-15 soil gas samples questions

#### Denise:

I have reviewed response and concerns for item #2 have been completely addressed with the extra information provided.

However regarding #1, I have learned that a separate Region 4 SOP is in place for Soil Gas Sampling which is distinct for the one developed for ambient air sampling. Collecting samples for soil gas air is very different than collecting ambient air samples. In this Soil Gas SOP Section 5 describes sampling and does include a provision for recording pressure/vacuum readings. This SOP, which I have attached a link, also covers other details involving sampling, including removal of stagnant/ambient air from sample string prior to collection and in Section 2.4 some specific Quality Control requirements (field blank, equipment rinsate blank, and field split). The original response probably is based on the ambient air SOP and not soil gas SOP.

I would recommend that we really need more information regarding sampling procedures followed to be able to wrap up review. Based on information I currently have it would appear that the appropriate SOP with its QC requirements may not have been followed raising some significant data usability concerns. Once we receive more detail regarding sampling I will be able to determine how to qualify results.

I have also attached copies of COCs, lab summa canister dilution worksheet from lab, and canisters pressures upon receipt at laboratory. These pressures range over a wide range from canister to canister.

Thanks.

Michael Keller
Chemist (Data Validation Team Lead)
Alion Science and Technology, Inc.
ESAT Contractor
USEPA Region 4/SESD
706-355-8656

From: Goddard, Denise

Sent: Thursday, May 15, 2014 3:59 PM To: Keller, Michael E.; Jones, Sue

Cc: Goddard, Denise

Subject: FW: Smokey Mountain Smelters (14-0103) - TO-15 soil gas samples questions

Sue / Michael......FYI.....

From: Austin, Janice [mailto:janice.austin@jmwaller.com]

Sent: Thursday, May 15, 2014 3:21 PM

To: Kestle, Rusty
Cc: Goddard, Denise

Subject: RE: Smokey Mountain Smelters (14-0103) - TO-15 soil gas samples questions

Good afternoon,

Please see the responses below regarding the comments generated during data validation.

- Vacuum gauge measurements were not recorded during this field event as the samples were collected as a grab
  sample and does not appear to be required per SESD SOP. To sample, Andrew connected the SUMMA canister
  directly to the PRT hose and allowed it to equilibrate. Sufficient time was given in order to allow the canister to
  be filled. Canisters were then couriered from the site (located in Knoxville) to Test America, Knoxville the same
  day of sample collection in order to maintain the integrity of the sample.
- 2. Test America Knoxville performed a batch certification on the canisters provided for sample collection. The majority of their summa canisters are batch certified where a batch of up to 16 canisters is cleaned in the same cleaning cycle, and the canister with the highest concentration prior to cleaning is analyzed for the requested target analytes. The canister that is analyzed is referred to as the certification blank. The canisters that were used for this project were batch certified and were cleaned in two different batches, the report contains the results for two certification blanks (i.e., canister 10333 is the certification blank for can cleaning job 140-768 and canister 09587 is the certification blank for can cleaning job 140-905). Attached are copies of the canister cleaning logs for these batches. The log contains the asset tags for all of the canisters that were cleaned and will help to provide a link between the canister certification results that were provided in the report and the canisters that were used for the samples. The canisters that were used for this project have been highlighted in yellow.

Please feel free to contact me should you have any additional questions.

Janice D. Austin, P.E. Project Manager

J. M. Waller Associates Inc.

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From: Kestle, Rusty [mailto:Kestle.Rusty@epa.gov]

Sent: Monday, May 12, 2014 2:44 PM

To: Austin, Janice

Cc: Goddard, Denise

Subject: FW: Smokey Mountain Smelters (14-0103) - TO-15 soil gas samples questions

Janice,

Will you please address these comments? Thanks!

Rusty

W. Russell Kestle, Jr.
Registered Professional Geologist (GA)
Senior Remedial Project Manager
Section C, Superfund Remedial Branch, Superfund Division
U.S. Environmental Protection Agency, Region 4
11th Floor
61 Forsyth Street, S.W.
Atlanta, GA 30303-8909

From: Goddard, Denise

Telephone: (404) 562-8819

Sent: Monday, May 12, 2014 2:33 PM

To: Kestle, Rusty

Cc: Goddard, Denise; Keller, Michael E.

Subject: FW: Smokey Mountain Smelters (14-0103) - TO-15 soil gas samples questions

Rusty....Can you forward this to JM Waller - we need the information requested below....Thanks....Denise

From: Keller, Michael E.

Sent: Monday, May 12, 2014 1:41 PM

To: Goddard, Denise

Subject: Smokey Mountain Smelters (14-0103) - TO-15 soil gas samples questions

#### Denise:

I have looked over the data package and have a few questions to be addressed so I can wrap up my review.

- (1). The COCs (pages 289 and 290) would suggest that grab samples (same start and stop time) were collected by Andrew Grimmke but do not provide any information in the columns labeled canister vacuum in field (start) and canister vacuum in field (stop). TestAmerica does show pressures @ receipt (page 291) which varied between 0.0 inches Hg to -13.8 inches Hg. Without any measurement from field I would have no way to determine whether or not canister may have leaked (increased pressure) between collection and lab receipt. For that matter if the evacuated canister had leaked after it was evacuated but before sampling I would have no way to verify whether the intended sample was collected. Maybe this information is available elsewhere maybe in a field log.
- (2). Test America does have a package section labeled "Clean Canister Certification" beginning on page 276 apparently for canister id No. 10333 (analyzed 1/23/14) and No. 09587 (analyzed 2/19/14). Neither of these were used for samples listed on COCs. TO-15 section 8.4.1.8 implies that each actual canister be tested and certified prior to use ("Any canister that has not tested clean should not be used. Once tested clean, the canisters are reevacuated ... and remain in the evacuated state until used"). The data in this "Clean Canister Certification" really can't be tied to the ten canisters used to collect sample from this site based on information in the package alone. Based on information available an assessment of canister cleanliness cannot be made and so whether positive hits reported are from sample or not

definitively. TestAmerica should be able to provide additional information on their cleaning and certification protocols to alleviate this major concern.

Please let me know if I can be of additional assistance.

Michael Keller Chemist (Data Validation Team Lead) Alion Science and Technology, Inc. ESAT Contractor USEPA Region 4/SESD 706-355-8656

September 08, 2014

Ms. Denise Goddard Environmental Protection Agency, Region 4 Science and Ecosystem Support Division 980 College Station Road Athens, GA 30605-2720

SUBJECT: Data Review and Validation Project No. DG-0728

Case No. NA ESAT TDF No. 14T0743

Sample Nos. SMSSV14 (140-1594-1), SMSSV15D (140-

1594-2), SMSSV15 (140-1594-3),

SMSSV16 (140-1594-4),

SMSSV AMBIENT (140-1594-5),

SMSSV10-20 (140-1594-6), SMSSV8-15 (140-1594-7), SMSSV13-11 (140-1594-8), SMSSV11-11 (140-1594-9), SMSSV9-10 (140-1594-10), SMSSV4-15 (140-1594-11), SMSSV3-10 (140-1594-12), SMSSV3D-10

(140-1594-13)

Sampling date(s): 06/25/14

Organic Analyses: TestAmerica, Knoxville, TN

Data for Site: Smokey Mountain Smelters, Knoxville, TN

Analysis: TO-15 (soil gas volatiles)

#### Dear Ms. Goddard:

The ESAT Work Team manually reviewed a Level 4 data package for thirteen soil gas (canister) grab samples analyzed for volatiles by *USEPA Compendium Method TO-15 Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)* (January 1999). Samples were collected by J.M. Waller Associates, Inc. (Atlanta, GA). Field sampling procedures were not included in the data package and were not reviewed and evaluated.

The laboratory was not submitted a performance evaluation sample (PES).

The samples were collected on 06/25/14 and were received by the laboratory on 06/26/14.

Data review was based primarily on the TO-15 method since neither the USEPA Region 4 organic data validation SOPs nor the organic National Functional Guidelines (NFGs) were explicitly developed for this type of analysis. Particularly, calibration criteria provided in and developed for TO-15 (maximum 30% RSD for ICAL and  $\pm 30\%$  D for CCAL with no ending CCAL check required) were used instead of the tighter USEPA Region 4 criteria, which are not applicable to the air matrix.

The laboratory submitted a complete Level 4 data package which overall demonstrated acceptable method based performance. Some recommended data qualifiers are detailed below.

Acceptable calibration performance including standard verifications, BFB tuning, internal standard area and retention time stability, surrogate recoveries (BFB) compliant method blank and laboratory control sample (LCS) recoveries were demonstrated. The laboratory reported a target analyte list that was a subset of the compounds present in the calibration standards and only reported positive hits that exceeded their reporting limit (RL). Values for the method detection limits (MDL) were not provided on the reporting forms. Mass spectrum were provided for all positive hits and documented identifications that were made.

The laboratory reported all results in both ppb v/v and  $\mu g/m3$  units.

The laboratory provided the canisters used for sample analysis and provided cleaning certification data in the data package. Each canister used for this project was analyzed after cleaning and these results were provided as part of the data package.

Five samples were collected using 6 L canisters and the remaining eight samples were collected using 1 L canisters. The laboratory measured canister pressures ranging from -1.5 in. Hg to -22.0 in. Hg upon receipt (see attachment). Canister vacuum in field measurements were provided both at the start and at the stop of sample collection and were documented on the Chain of Custody (COC) Record. All canisters were fully evacuated at the start of sampling and pressures at the end of sampling reasonably agreed with those measured by the laboratory upon sample receipt. The laboratory used sample volumes of between 20 ml and 91 ml with four samples also being diluted (2.3-111X) and all were brought up to 500 ml, which was the volume used for the calibration standards. Presumably the laboratory was able to achieve the desired project reporting limits using these dilutions and reduced sample volumes.

Area counts for all positive sample hits reported were compared to the area counts for the analyte reported in the canister cleaning certification analysis. Due to variable sample volumes used merely comparing final results alone was not appropriate. Accordingly, the sample area for trichloroethene (14355) was similar to the canister check (10066) and the sample area for 1,1,2-trichloro-1,2,2-trifluoroethane (16906) was similar to the canister check (14738) for sample SMSSV AMBIENT (140-1594-5). It is recommended that both of these results be "U" qualified at the laboratory's reported values (B-4). Similarly, the sample area for toluene (97988) was less than 5X of the associated canister check (20273) for sample SMSSV11-11 (140-1594-9). It is recommended that this result be "U" qualified at the laboratory's reported value (B-4).

Please refer to the attached Data Quality Assessment Record. If you have any questions, please contact this office.

Very Truly Yours:

Michael E. Keller Chemist (Data Validation Team Lead) Alion Science and Technology

#### **Data Quality Assessment Record (DQAR)**

Review Date:	09/08/14	Analyses:	VOA Soil Gas by TO15	Matrix: Air	Project #:	DG-0728
SDG /Lab	File:	140-1594-1	·			
Laboratory	: TestAn	nerica, Knoxv	ille, TN			
Site Name:	Smoke	y Mountain S	melters, Knoxville	e, TN		
Check On	e: EPA	ESAT	CLP	Other (specify	Non-CLI	P (RAS)
Sample N	lumbers –	Lab Sample	ID:			
SMSSV14		140-1594-1	SMSSV3-10	140-1594-12		
SMSSV15D	)	140-1594-2	SMSSV3D-10	140-1594-13		
SMSSV15		140-1594-3				
SMSSV16		140-1594-4				
SMSSV AN	IBIENT	140-1594-5				
SMSSV10-2	20	140-1594-6				
SMSSV8-15	5	140-1594-7				
SMSSV13-1	11	140-1594-8				
SMSSV11-1	11	140-1594-9				
SMSSV9-10	)	140-1594-10				
SMSSV4-14	<u> </u>	140 1504 11				

#### I. SUMMARY OF PROBLEMS AND COMMENTS:

A summary of deficiencies noted for the method used to generate data for this project is presented below. For the purposes of this review, the QC limits specified in the analytical method have been applied to the data. Data review was based primarily on the *USEPA Compendium Method TO-15 Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)* (January 1999) since neither the USEPA Region 4 organic data validation SOPs or the organic National Functional Guidelines (NFGs) were explicitly developed for this type of analysis. Particularly, calibration criteria provided by and developed for TO-15 (maximum 30% RSD for ICAL and ±30% D for CCAL with no ending CCAL check required) were used instead of the tighter USEPA Region 4 criteria, which are not applicable to the air matrix.

II.	Data Quality Assessment (An explanation for any "no" answer must be p? = see remarks	orovided	<b>l</b> )	
1.	Summary:	Yes	N/A	No
	Were all requested analyses performed?	X		
	Were all required OC checks performed?	X		
	Were all required documents present?	X		
	Were requested detection limits met?		?	
	Remark: Requested reporting limits not known to reviewer and the laboratory did not include MDLs on their reporting forms. Laboratory did use reduced sample volumes and dilutions for some samples.			
2.	Holding Times:	Yes	N/A	No
	VOA/BNA/PEST prepared within 14 days of sampling (7 days for VOA aromatics in non-preserved samples)?	X		
	PCDD/PCDF extracted within 30 days of sampling?		X	
	Extracts analyzed within 40 days of extraction?		X	
	Were all samples/extracts properly preserved?	X		
	For TCLP: Were RCRA TCLP holding times met?		X	
	Remark:			
3.	GC/MS Tuning:	Yes	N/A	No
	Were PFK/DFTPP/BFB criteria met?	X		
	<b>Pesticides:</b> Were standards run in proper sequence?		X	
	Combined DDT/Endrin Breakdown acceptable?		X	
	Retention time windows defined?		X	
	Remark:			

4.1	Initial Calibration:	Yes	N/A	No
	Were %RSDs acceptable?	X		
	Were RRFs acceptable?		X	
	Was S/N acceptable?		X	
	Were PCDD/PCDF ion ratios acceptable?		X	
	Remark: Initial calibration satisfied TO15 criteria.			
4.2	Continuing Calibration:	Yes	N/A	No
	Were %RSDs acceptable?	X		
	Were RRFs acceptable?		X	
	Were PEST cont. calib. factors met?		X	
	Was PCDD/PCDF S/N acceptable?		X	
	Were PCDD/PCDF ion ratios acceptable?		X	
	Remark: Continuing calibration satisfied TO15 criteria.			
5.	Spikes:	Yes	N/A	No
	Was a method spike analysis performed?	X		
	Were matrix spike/ms. duplicate analyses performed?			X
	Were acceptable recoveries obtained?	X		_
	Was acceptable precision obtained?		X	-
			-	
	Remark: Acceptable recoveries obtained for LCS. No measure o Acceptable precision was demonstrated for two pairs of what app			
6.	Blanks:	Yes	N/A	No
	Were blank analyses performed?	X		
	Were any contaminants noted?	X		
	If yes, were blank rules applied to the data?	X		

Remark: Areas in canister certification check similar to or not >5X sample areas for the same canister for a few analytes in a couple of samples.

7.	Performance Evaluation Sample:	Yes	N/A	No
	Was a P.E. Sample analyzed with the samples?			X
	If yes, were acceptable results obtained?		X	
	Remark: No PES submitted.			
8.	Internal Standard / PCDD/PCDF Recovery Standards:	Yes	N/A	No
	Were peak areas acceptable?	X		
	Remark:			
9.	Surrogates / PCDD/PCDF Internal Standards:	Yes	N/A	No
	Were peak areas acceptable?	X		
	Remark:			
10.	Compound Identification / Quantification:	Yes	N/A	No
	Were all positive results confirmed?	X		
	Was supporting documentation included?	X		
	Was a check of the calculations performed?	X		
	If yes, were results acceptable?	X		
	PCDD/PCDF ion ratios acceptable?		X	
	Remark:			
11.	Tentatively Identified Compounds?	Yes	N/A	No
	Were TICs requested for these analyses?		X	
	If yes, were results provided?		X	
	Remark: TICs were not reported.			

### III. Data Summary

Based on a review of the data provided, the following is a table summarizing the data qualifiers used by Region 4 for this report.

Recommended Data Qualifiers							
Case NA			Project Number:	DG-0728	ELEMENT Sample ID. Nos		NA
		/ Mountai	in Smelters, Knox	<u> </u>		0/08/14	IVA
Sample		A	analyte(s)	Laboratory R Qualifie	-	ESA	AT Suggested
SMSSV AMBIE	MISSV AMBIENT I frichloro-177- I none		(canister possible rce of result)				
SMSSV11-11		toluene		none			canister possible rce of result)

### September 18, 2014

Ms. Denise Goddard United States Environmental Protection Agency Science and Ecosystem Support Division 980 College Station Road Athens, GA 30605-2720

Subject: Data Review and Validation

Site Name: Smokey Mountain Smelters, Knoxville, TN

Project No.: DG-0730 and DG-091714 ELEMENT Sample ID. Nos: NA

Inorganic Analysis: TestAmerica Laboratories, Inc., Savannah, Ga

Date(s) Sampled: 6/24/14 - 6/26/14

VTSR Date: 6/27/14 Date Received from Lab:

TDF No.: 14T0744 and 14T0895

#### Dear Ms. Goddard:

The ESAT Work Team has reviewed the above-captioned data package consisting of adequate deliverables to document EPA Methods 5310B for TOC; 7196A for hexavalent chromium; 2320B for alkalinity; E350.1 for ammonia; E365.1 for orthophosphate; 4500 for sulfide; E300.0 for nitrate, nitrite, fluoride, chloride, and sulfate; and 2540C for total dissolved solids (TDS) for 28 water samples according to EPA guidelines. This package presents acceptable technical performance and generally met the standard for quality required by Region 4 except as detailed below.

Dilutions for nitrate and nitrite were performed on select samples which resulted in elevated reporting and detection limits.

Examination of laboratory blank samples revealed apparent low-level contamination with several analytes. Reported detection limits were adjusted as high as ten times the blank levels to discount possible false positives due to contamination in laboratory blanks.

A Stage 4 validation consisting of manual review was performed on the inorganic samples submitted for this case.

Further details are provided in the attached review summary form. Please feel free to contact this office if we can be of further service.

Very truly yours,

Sue Jones

Chemist

Alion Science and Technology ESAT Contractor, Region 4 EPA

#### Inorganic Data Quality Assessment Record (DQAR)

Review Date:	9/18/14	Analyses:	TOC, NO ₃ , NO ₂ , oPO ₄ , SO ₄ , F, CI, NH ₃ , Sulfide, Alk., TDS, Cr*6	Matrix:	Water	Project #:	DG-0730 & DG-091714
SDG/L	SDG /Lab File: Laboratory		2655, 680-102773, 680	-102616, 68	0-102707		
Labo				TestAmeric	a Laboratories, l	Inc.	
Site I	Vame:		Smok	ey Mountai	n Smelters, Knox	ville, TN	
Check One:		EPA	ESAT	CLP	Other (specify)	Non-CI	P (RAS)

Signatures: SJ

Reviewer

Review Codes: M- Metals, O- Others

Sample Numbers: Water: Soil/Sediment: SMSMW902A SMSSW05 SMSMW04A SMSSWGW13 SMSSW20 SMSMW10B SMSMW02A SMSMW08A SMSMWIIA SMSSW10 SMSMW01A SMSSW13 SMSSW09 SMSMW13B SMSSW14 SMSSW09 Spring SMSMW03B SMSSW01 SMSSW11 SMSSW08 Spring SMSSW08 SMSSW04 SMSSW94 SMSMW07A SMSMW12A SMSMW12B SMSMW07B SMSMW11B

#### SUMMARY OF PROBLEMS AND COMMENTS:

A summary of deficiencies noted for the methods used to generate data for this project is presented below. Please refer to the Data Quality Assessment Record (DQAR) for each data file and the data flag summary table at the end of this review document. For the purposes of this review, the QC limits specified in the analytical method have been applied to the data. Data qualifier recommendations are made in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (Functional Guidelines), and the Region 4 SOP, Data Validation Standard Operating Procedures for Contract Laboratory Program Routine Analytical Services (R4DVSOP).

### **Data Review Comments:**

	II. Data Quality Assessment (An explanation for any "no" answer must be provided)			
1.	Summary	Yes	N/A	No
	Were all requested analyses performed?	O, M		
	Were all required QC checks performed?	O, M		
	Were all required documents present?	O, M		0
	Were requested detection limits met?	?	5.55-8.77 (4.)	
Ren	nark: Project required detection limits are unknown. Raw data missing for sulfide and TDS.			
2.	Holding Times:(Holding times are not applicable for non-aqueous samples)	Yes	N/A	No
	Were water samples properly preserved?	O, M		
	Were water holding time requirements met?	O, M		0

	Remark: Holding times missed for nitrate and nitrite in select samples. In some callaboratory.			
	Calibrations:	Yes	N/A	No
	A. Initial Calibration:		FIRE ROLL	Marie 1
_	Were acceptable correlation coefficients obtained?	O, M		
	Were acceptable % Recoveries for analytes obtained?	O, M		
	B. Continuing Calibration		REVINE	\$15 UNES
	Were acceptable % Recoveries for analytes obtained?	O, M		
	Remark: Evaluation was performed according to the laboratory calibration limits for of the +- 10% customarily used for metals evaluation.		lytes which a	re outsid
_	Blanks:	Yes	N/A	No
<u> </u>	Were any contaminants noted in the blanks?	0		M
_	If yes, were blank rules applied to the data?	0	M	141
	Remark: NH ₃ and PO ₄ were found in laboratory blanks. 10X rule applied.		141	
	ICP Interference Check Sample:	Yes	N/A	No
_	Were results within 20% of the true value?	165	150100000000	140
_	Were False positives Reported?		O, M	
_			O, M	
_	Were False negatives reported?  Remark:		O, M	
_	Remark:		-144 <u>-</u>	
	Matrix spikes:	Yes	N/A	No
	Was a matrix spike analysis performed?	O, M		0
	Were samples spiked at appropriate levels?	O, M		0
	Were matrix spike/matrix spike duplicate analyses performed?	O, M		0
	Were acceptable recoveries obtained?	O, M		0
	Was acceptable precision obtained?	O, M		0
	Remark: MS/MSD analysis performed for Cr ⁺⁶ , anions, ammonia, TOC, and orthop were used for accuracy and precision information for remaining parameters. Recov			
	and nitrate. Nitrite recovery was low in the MS/MSD. Only samples that were spik	ked were qualified.		
	Matrix duplicate analysis:		N/A	
	Matrix duplicate analysis:  Was a matrix duplicate analysis performed?	ked were qualified.		No
	Matrix duplicate analysis:  Was a matrix duplicate analysis performed?  Was duplicate precision in control?	Yes O	N/A O, M	No O, N
	Matrix duplicate analysis:  Was a matrix duplicate analysis performed?	Yes O LCS/LCSD and/or	N/A O, M	No O, N
	Matrix duplicate analysis:  Was a matrix duplicate analysis performed?  Was duplicate precision in control?  Remark: Duplicate analysis performed for alkalinity, TDS, NH ₃ , oPO ₄ , and sulfide.	Yes O LCS/LCSD and/or	N/A O, M	No O, N
	Matrix duplicate analysis:  Was a matrix duplicate analysis performed?  Was duplicate precision in control?  Remark: Duplicate analysis performed for alkalinity, TDS, NH ₃ , oPO ₄ , and sulfide and RPDs were used for accuracy and precision information for all other parameter	Yes O LCS/LCSD and/or	N/A O, M MS/MSD rec	No O, No overies
	Matrix duplicate analysis:  Was a matrix duplicate analysis performed?  Was duplicate precision in control?  Remark: Duplicate analysis performed for alkalinity, TDS, NH ₃ , oPO ₄ , and sulfide and RPDs were used for accuracy and precision information for all other parameter.  Performance Evaluation Sample (PES):	Yes O LCS/LCSD and/or	N/A O, M MS/MSD rec	No O, No overies
	Matrix duplicate analysis:  Was a matrix duplicate analysis performed?  Was duplicate precision in control?  Remark: Duplicate analysis performed for alkalinity, TDS, NH ₃ , oPO ₄ , and sulfide, and RPDs were used for accuracy and precision information for all other parameter  Performance Evaluation Sample (PES):  Was a PES analyzed with the samples?	Yes O LCS/LCSD and/or	N/A  O, M  MS/MSD rec	No O, No overies
	Matrix duplicate analysis:  Was a matrix duplicate analysis performed?  Was duplicate precision in control?  Remark: Duplicate analysis performed for alkalinity, TDS, NH ₃ , oPO ₄ , and sulfide, and RPDs were used for accuracy and precision information for all other parameter  Performance Evaluation Sample (PES):  Was a PES analyzed with the samples?  If yes, were acceptable results obtained?	Yes O LCS/LCSD and/or	N/A  O, M  MS/MSD rec	No O, M

-	Was acceptable precision obtained?	O, M	1 4 // (122224)	
	Remark:			
10.	ICP Serial Dilution Sample:	Yes	N/A	No
	Was ICP serial dilution analysis performed?			O, M
	Were diluted results within 10% of undiluted sample result?		O, M	, in
	Remark:			
11.	Completeness:	Yes	N/A	No
	Were all requested analyses performed?	O, M		
	Were all required documents present? If yes, were results provided?	O, M		0
	Were results of calculation checks acceptable?	O, M		
	Remark: Raw data not provided for TDS and sulfide.			

# **Additional Comments:**

# III. Data Qualifiers Summary

Based on a review of the quality control information, the following is a table summarizing the data qualifiers used by Region 4 for this data review report.

		Recommended	Data Qualifiers			
Case:	NA	Project Number:	DG-0730 & DG- 091714			NA
Site:	Smoke	y Mountain Smelters, Kn	oxville, TN	Da	ite:	9/18/14
Affected Samples		Analytes	Recommended Q	ualifiers		Reason
SMSMW10B	Ammor		J, QM-2		Recovery of acceptance li	MS/MSD above
SMSMW11A	Nitrate		J, QM-2		acceptance li	
SMSMW02A	Nitrite		J, QM-1		Recovery of acceptance li	MS/MSD below mits.
SMSSWGW13, SMSM SMSSW08 Spring, SMS SMSSW04, SMSSW94, SMSMW07A	ISMW04A, Ortho-phosphate J, Q-2 Concentration <ri smssw08,<="" td=""><td>on <rl and="">MDL</rl></td></ri>		on <rl and="">MDL</rl>			
SMSSW20, SMSSW01, SMSSW11, SMSMW12 SMSMW12B		2	J, Q-2		Concentration <rl and="">MDL</rl>	
SMSSW13, SMSSW09, SMSSW01	Nitrate		J, H-4		Holding time expired prior to receipt by laboratory	
SMSSW13, SMSSW09, SMSSW14, SMSSW09 SMSSW01, SMSSW11, SMSSW08 Spring, SMS SMSMW12B, SMSMW	Spring, SSW08,	ia	U, B-4		Sample conc	. < 10X blank value
SMSSW13, SMSSW09, SMSSW01	Nitrite		J, H-4		Holding time expired prior to receipt by laboratory	
SMSSW09, SMSSW01, SMSSW08 Spring, SMS		rganic Carbon	J, Q-2		Concentration <rl and="">MDL</rl>	
SMSSW09 Spring	Nitrate		J, H-6		Reanalysis not within holding time.	
	Nitrite		J, H-1	7.57	Holding time	evreeded

SMS site Knoxville, Tn

Site ID:		Date:	110509	<b>]</b>
Field Sample ID:			<ms< th=""><th>FTBØI</th></ms<>	FTBØI
Site Subsite	Matrix ID	QC Type	Date	I (DE)
	-	I	10505	1230PM
Program Code: 0 0 0 1	GPS: Yes No	Total Weight (g):		
		Fish #1		
LM Bagg Fis	h species	Comments: Filet	Meralt & AS	
	h length (total) (mm)		weight: 45	600=172,9
	h weight (g)			
		HETWIN	HE WE HOW !	5, 41,49
		Fish #2		
Fis	h species	Comments:		
	h length (total) (mm)			
	h weight (g)			
	<b></b>			
		Fish #3		
Fis	h species	Comments:		
	h length (total) (mm)	,		
	h weight (g)			
	5 (6)			
		Fish #4		
Fisi	h species	Comments:		
Fisl	h length (total) (mm)			
Fisl	h weight (g)			
		Fish #5		
Fish	h species	Comments:	· , ,	
	h length (total) (mm)			
	h weight (g)			
	<u> </u>			
Form Completed By:	JK	•	Date:	5/5/11

SMS site Knox ville, Tn

Site ID:	Date: 110505
Field Sample ID:           Site         Subsite         Matrix ID           -         -         -           Program Code:         0         0         0         1           GPS:         Yes         No	SMS FTBOIR  OCType Date  Date  Total Weight (g):  SMS FTBOIR  Date  Date  Date  Mote: 609 Mass present
	Fish #1
Fish species Fish length (total) (mm) Fish weight (g)	Comments: Fillet wt. ; 3189
	Fish #2
Fish species Fish length (total) (mm) Fish weight (g)	Comments:
	Fish #3
Fish species Fish length (total) (mm) Fish weight (g)	Comments:
	Fish #4
Fish species Fish length (total) (mm) Fish weight (g)	Comments:
	Fish #5
Fish species Fish length (total) (mm) Fish weight (g)	Comments:
Form Completed By:	Date: 5/5///

SMS site Knoxville, Tr

Site ID:		Date:	udsos	
Field Sample ID:  Site Subsite	Matrix ID  Yes No Tot	`	SMS F Date ) S 0 9 1	TBØ2 PM
		Fish #1		
Fish spec Fish length Fish weig	ies Con th (total) (mm) th (g)	ments: llet wt. i.mom 'llet wt. org	ganic: 249 anic: 191,	#440.E
		Fish #2		
Fish speci Fish lengt Fish weig	th (total) (mm)	ments:		
	,	Fish #3		
Fish speci Fish lengt Fish weig	th (total) (mm)	ments:	,,,	
***************************************		Fish #4		-
Fish speci Fish lengt Fish weigl	h (total) (mm)	ments:		And Andrews Market Control of the Co
	. 1	Fish #5		
Fish speci Fish lengt Fish weigl	h (total) (mm)	ments:	,	
Form Completed Dv	JK		Data	5/5/11

SMS Site Knoxville, TX Fish Sample Attribute Form

Site ID:	Date: 110505
Field Sample ID:    Site	SMSFTBØ2R   SMSFTBØ2R   Date   Date
	Fish #1
Fish species Fish length (total) ( Fish weight (g)	(mm) Comments:  Filet Wt. 194.0
	Fish #2
Fish species Fish length (total) ( Fish weight (g)	(mm)
	Fish #3
Fish species Fish length (total) ( Fish weight (g)	mm)
	Fish #4
Fish species Fish length (total) ( Fish weight (g)	mm)
	Fish #5
Fish species Fish length (total) (	mm)
Form Completed By:	JK Date: 5/5///

SMS Site Knoxville, Tn

Site ID:		Date: 1 1 0 5 0 5
Field Sample ID: Site	Subsite Matrix ID	QC Type Date  QC Type Date  1 1 0 5 0 5 130 pm  Note: egg mass present
0 0 0 1	GPS: Yes No	Total Weight (g):
·		Fish #1
LM Bas 460 1500	Fish species Fish length (total) (mm) Fish weight (g)	Fillet wto expanse 25th
		Fish #2
	Fish speciesFish length (total) (mm)Fish weight (g)	Comments:
		Fish #3
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #4
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #5
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
Form Completed I	Bv: 5	Date: 5/5/1/

SMS Site Knoxville, Th

#### Fish Sample Attribute Form

Site ID:		Date: 1 ( 0 5 0 5
Field Sample ID: Site Sul Program Code: 0 0 0 1	osite Matrix ID  - Matrix ID  GPS: Yes No	QC Type Date 145PM  October Egg Mass Present  Total Weight (g):
LM Bass 4 <b>8</b> 0 1500	Fish species Fish length (total) (mm) 480 Fish weight (g)	Fish#1  Comments: Fillet wto estate \$ 506.8  Fillet wto integrate \$ 257.1
Fish #2		
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
Fish #3		
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
Fish #4		
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #5
	Fish species Fish length (totał) (mm) Fish weight (g)	Comments:
Form Completed By:		Date: 5/5///

Sample split for duplicate SMSFTBOYD



Site ID:		Date: [/ ] [0 5 0 5
Site   Su     -	bsite Matrix ID  -	SMSFTBØS  QC Type Date  1 0 5 0 5 220 PM  Total Weight (g):
LM Bass	Fish species	Fish #1 Comments:
525 2000	_Fish length (total) (mm) _Fish weight (g)	Fillet Wt.: 631g
		Fish #2
	Fish species	Comments:
	Fish length (total) (mm)	
	_Fish weight (g)	
,		Fish #3
	Fish species	Comments:
,	Fish length (total) (mm)	
	Fish weight (g)	
		Fish #4
	Fish species	Comments:
	Fish length (total) (mm)	
	Fish weight (g)	
		Fish #5
	Fish species	Comments:
	Fish length (total) (mm)	
	Fish weight (g)	
Form Completed By	:	Date: 5/5/11

SMS Site Knoxville, Th

Site ID:		Date: [   0 5 0 5
Field Sample ID: Site Su Program Code: 0 0 0 1	dbsite Matrix ID  GPS: Yes No	QC Type Date Date 2 40 PW Date Note i egg Mass presei
		Fish #1
LM Boy 365 150	Pish species Fish length (total) (mm) Fish weight (g)	Fillet Wt. 260.3
		Fish #2
	_Fish species _Fish length (total) (mm) _Fish weight (g)	Comments:
		Fish #3
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #4
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #5
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
Form Completed By	: JK	Date: 5/5/1/

Sors site

Wholobooly

Site ID:		Date: //0565
Field Sample ID: Site Site S Program Code: 0 0 0 1	Subsite Matrix ID  - Matrix ID  GPS: Yes No	QC Type Date Total Weight (g):
		Fish #1
Buogill 192 116.1	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #2
Blung:14 168 69.1	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #3
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #4
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
and the second s	23.30	Fish #5
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
Form Completed B	y: To-	Date: 5/5/11

SMS Site Knownille, TN

aholo body

Site ID:		Date: 050
Field Sample ID:  Site  Site  Program Code:  0 0 0 1  Slucz, H  1 75	GPS: Yes No  Fish species Fish length (total) (mm) Fish weight (g)	QC Type Date Total Weight (g):  Fish #1  Comments:
131 azz: M 182 97.0	Fish species Fish length (total) (mm) Fish weight (g)	Fish #2 Comments:
BLUOGIU 159 54.7	Fish species Fish length (total) (mm) Fish weight (g)	Fish #3 Comments:
And the second s	Fish species Fish length (total) (mm)	Fish #4 Comments:
	Fish weight (g)	Fish #5
	Fish species Fish length (total) (mm) _Fish weight (g)	Comments:
Form Completed B	y: <u>T</u> W	Date: 5/5/1

SMS S.to Know Mb, th

Wholobody

Site ID:		Date: 1 1 0 5 0 5
Field Sample ID: Site Program Code: 0 0 0 1	Subsite Matrix ID  - No No	QC Type Date  Total Weight (g):  Fish #1
195 128.1	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #2
150 4B	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #3
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #4
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #5
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
Form Completed I	By: The	Date: 5/5/11

able boxly

Sms site Knowll, TU

Site ID:		Date: // 0 5 6 5
Field Sample ID: Site - Program Code: 0 0 0 1	Subsite Matrix ID  -	QC Type Date  Total Weight (g):
Blnag, 4 170	Fish species Fish length (total) (mm)	Fish #1 Comments:
83.0	Fish weight (g)	Fish #2
63/40xill 161 63.6	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #3
Brugs. U 119 29.4	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #4
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #5
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
Form Completed I	By: Th	Date: 5 /5-/11

SME SITE KNOWN !!! TN whole body

Site ID:		Date: / / Ø 5 Ø 5
Field Sample ID:		SMS FTS ØZR
1	Subsite Matrix ID	QC Type Date
- I	- '	
Program Code:		
0 0 0 1	GPS: Yes No	Total Weight (g):
		Fish #1
Musi, U	Fish species	Comments:
Blussel1	Fish length (total) (mm)	
97.3	Fish weight (g)	
77.00		
		Fish #2
Blogill	Fish species	Comments:
180	Fish length (total) (mm)	
93.6	Fish weight (g)	
	_	
		Fish #3
Bluegill	Fish species	Comments:
Bluegist 165	Fish length (total) (mm)	
71.4	Fish weight (g)	
	···	
		Fish #4
	Fish species	Comments:
	Fish length (total) (mm)	
	Fish weight (g)	
	·	Fish #5
	Fish species	Comments:
	Fish length (total) (mm)	
	_Fish weight (g)	
		1-1-11
Form Completed B	y: Ta	Date: 05/85/1/
		,

SMS Sites Flowidle, Th

Whole body

Site ID:		Date: 1 / 0 5 0 5
Field Sample ID: Site	Subsite Matrix ID - GPS: Yes No	QC Type Date  Total Weight (g):
Queget 165	Fish species Fish length (total) (mm)	Fish #1 Comments:
82·3	Fish weight (g)	Fish #2
130 34.5	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #3
130 34.2	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #4
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #5
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
Form Completed I	3y: 77w	Date: \$\s\/\i\

Sms Site Knoxville, TN

Wholobody

Site ID:		Date: 1 1 0 5 0 5
Field Sample ID: Site - Program Code: 0 0 0 1	Subsite Matrix ID  GPS: Yes No	QC Type Date  Total Weight (g):
		Fish #1
154 74.3	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #2
Blung.M 125 35.6	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #3
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #4
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #5
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
Form Completed	Pu Tu	Date: 5/5/11

Sms Site

Who to book

Site ID:		Date: / / 0 5 0 5	
Field Sample ID:  Site S Program Code:  0 0 0 1   Rungil 1  16 3  74.7	GPS: Yes No  Fish species Fish length (total) (mm) Fish weight (g)	OC Type Date  Total Weight (g):  Fish #1  Comments:	
Rungal 145	Fish weight (g)  Fish species Fish length (total) (mm)  Fish weight (g)	Fish #2 Comments:	
		Fish #3	
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:	
		Fish #4	
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:	
	20an an a	Fish #5	
	_Fish species _Fish length (total) (mm) _Fish weight (g)	Comments:	
Form Completed B	y: <u>Th</u>	Date: 5/5/11	



Site ID:		Date: [[[[]]5](]5]
Field Sample ID:  Site  S  Program Code:  0 0 0 1	ubsite Matrix ID  -	QC Type Date SMS FTCØ/
		Fish #1
Carp 415 900	Fish species Fish length (total) (mm) Fish weight (g)	Fillet wt. 188.99 74.0 74.0
		Fish #2
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #3
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #4
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #5
	_ Fish species _ Fish length (total) (mm) _ Fish weight (g)	Comments:
Form Completed B	y: JK	Date: 5/5/1/

SMS site Knoxuille, TN

### Fish Sample Attribute Form

Site ID:		Date: 110505
Site   Su   Su   Su   Su   Su   Su   Su   S	bsite Matrix ID - GPS: Yes No	OC Type Date SMSFTCØIR  OCTYPE Date SMSFTCØIR  Total Weight (g):
0 0 0 1	Gr3. 165 140	A Otal Weight (g):
		Fish #1
2750	_Fish species _Fish length (total) (mm) _Fish weight (g)	Fillet wt. 1872689
		Fish #2
	_Fish species _Fish length (total) (mm) _Fish weight (g)	Comments:
		Fish #3
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #4
No. 10. 10. 10. 10. 10. 10. 10. 10. 10. 10	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
	· · · · · · · · · · · · · · · · · · ·	Fish #5
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
Form Completed By	: JK	Date: 5/5///

153

SMS Site IN N

Site ID:		Date: [[[(]()] 5]()] 5
Field Sample ID: Site S Program Code: 0 0 0 1	ubsite Matrix ID  - Matrix ID  GPS: Yes No	SMSFTCØ2 Date OGOSOS  Total Weight (g):
		Fish #1
Cav P 480 1500	Fish species Fish length (total) (mm) Fish weight (g)	Fillet wt. 259.8
		Fish #2
	Fish species _Fish length (total) (mm) _Fish weight (g)	Comments:
		Fish #3
	Fish species	Comments:
	Fish length (total) (mm) Fish weight (g)	
		Fish #4
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #5
	_Fish species _Fish length (total) (mm) _Fish weight (g)	Comments:
Form Completed B	y:	Date: 5/5///

SMS Sitery Kuckcuille, TN Fish Sample Attribute Form

Site ID:		Date: [[ ] 0 5 0 5
Field Sample ID:	ubsite Matrix ID  - ' No No	SMSFTCØ2R Date - 100505 3pm  Total Weight (g):
		Fish #1
Cay P 480 1750	Fish species Fish length (total) (mm) Fish weight (g)	Comments: Fillet, Wt. 195 H. gide Fillet
		Fish #2
	_Fish species _Fish length (total) (mm) _Fish weight (g)	Comments:
		Fish #3
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #4
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #5
	_Fish species _Fish length (total) (mm) _Fish weight (g)	Comments:
Form Completed By		Date: 5/5/1/

SMS site Knoxville, Th

Site ID:	Date: [ ] ( ] ( ] ( ] ( ] ( ]	<u> </u>
Field Sample ID:	Matrix ID QC Type Date	5MS FTCØ3 315pm
	Fish #1	
Fish species  500 Fish length (total  (700) Fish weight (g)	Comments: Filet wt. 23 History filet	39
N. C.	Fish #2	·
Fish species Fish length (total Fish weight (g)  Fish species	Fish #3 Comments:	
Fish length (total Fish weight (g)		
	Fish #4	
Fish species Fish length (total) Fish weight (g)	Comments:	
WO	Fish #5	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Fish species Fish length (total) Fish weight (g)	(mm)	
Form Completed By:	JK Date	e: 5/5/1

SMS site The Functional Strategy of the Strate

Site ID:		Date: [[] [0] 5] () 5
Field Sample ID: Site Sub Program Code: 0 0 0 1	osite Matrix ID GPS: Yes No	QC Type Date SMS FTC Ø4    O
		Fish #1
430	Fish species Fish length (total) (mm) Fish weight (g)	Comments: Fillet Wti 193,7
		Fish #2
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #3
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #4
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #5
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
Form Completed By:	JK	Date: 5/5/11

SMS-Site KnoxuliejTN

Site ID:		Date: 11/05	015
Field Sample ID: Site Sul Program Code: 0 0 0 1	osite Matrix ID  -	QC Type Date  Output  Output  Output  Date  Output  Output  Date  Output  Date  Date  Output  Date  Output  Date  Date	SFTCØ5 9 320pm
		Fish #1	
Carp 510 1800	Fish species Fish length (total) (mm) Fish weight (g)	Comments: Fillet wt 10 Wt. Side	2389
		Fish #2	***************************************
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:	
		Fish #3	
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:	
		Fish #4	
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:	
	Charles Commission Com	Fish #5	
5 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	Fish species Fish length (total) (mm) Fish weight (g)	Comments:	
Form Completed By:	J1		Date: 5/5///

SMS site Knoxuille, TN

Site ID:		Date: 110505
Field Sample ID:  Site S Program Code: 0 0 0 1	ubsite Matrix ID - GPS: Yes No	QC Type Date SMS FTC Ø6  Total Weight (g):
		Fish #1
(avp 450 1100	Fish species Fish length (total) (mm) Fish weight (g)	Comments: Fillet wt. , 292,2
		Fish #2
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #3
	_ Fish species _ Fish length (total) (mm) _ Fish weight (g)	Comments:
		Fish #4
	Fish species Fish length (total) (mm) Fish weight (g)	Comments:
		Fish #5
	_ Fish species _ Fish length (total) (mm) _ Fish weight (g)	Comments:
Form Completed B	y: JK	Date: 5/5/11



Ket mead wolvy area

Stream Cl	haracterization Form			
Reach ID: 505WØ1	Investigators: TK CTR			
Weather: Cloudy 60° 12 PM	Stream FLOUNIAUS Date: 5/4/11			
Well developed baseflow and bankfull channel  Consistent floodplain features easily identified  Predictable chanel morphology  One terrace apparent above active floodplain  Floodplain covered by diverse vegetation  Streambanks <= 45 degree	Headcuts  Exposed cultural features (channel bottom)  Sediment deposits absent or sparse  Exposed bedrock (part of reach)  Streambank slopes > 45 degree			
TYPE 3  Streambank sloughing  Sloughed material eroding  Streambank slopes > 60degree or vertical/undercut  Accelerated bend migration  Frosion on inside of bends  Exposed cultural features (channel banks)  Exposed bedrock (majority of reach)	TYPE 4  Streambank aggrading Sloughed material not eroded Sloughed material colonized by vegetation Baseflow, bankfull and floodplain channel developing Predictable channel morphology developing Streambank slopes <= 45 degree			
TYPE 5  Well developed baseflow and bankfull channel Consistent floodplain features easily identified Two terraces apparent above active floodplain Predictable chanel morphology Streambanks <= 45 degree	Notes			
Representative of 100 % of total reach length commant Substrate  Representative of 100 % of total reach length 3. Sand 4. Gravel 5. Cobble 6. Boulder 7. Bedrock 8. Other (specify)				
alot of what see Sandy  typ. For a Type 3  noted above, - area just of  esp. stream bend of headwaters				
- Claybattom	<u>5(0V)</u>			



Stream: FLOURTAUM head waters **Cross Section Data** Investigators: TK CTR Reach ID:_ 2011 Watershed: Distance from X-Section (ET) Left Bank (ft) Abbreviation edge channel >3.2° edgechan,



In-Stream	Characteristics Form	
Reach ID: 505W01	Investigators: JK CJR	
Date: 5/4/1/ 120W		
A. Water Appearance	B. Water Odor	
1. Clear 6. Dark Brown	1. Sewage 4. Rotten Eggs	
2. Milky 7. Oily Sheer	2. Chlorine 5. None	
3. Foamy 8. Reddish 9. Greenish	I Section	
4. Turbid 5019 9. Greenist	3. Fishy	
5. Light Brown Other	Other	
34 nta		
C. Sediment Odor	D. Fish	
1. Sewage 4. Rotten Eggs	D. Fish  Shone  but did note	
2. Chlorine 5. Oxidation	Small (1-2 in.) SM, Salaway all	
3. Petroleum	Small (1=2 in.) SM, Salaman dey  Medium (3-6 in.)	
	Large (7 in. & above)	
Other SULFLY		
E. Aquatic Plants	F. Algae	
./.	Algae "slime" coating None Light Heavy	
Percent Area 10 - 30 %	Color: Brown Green Other	
1 10 % 30 - 50 %		
If present, are they Attached Free-flowing	Filamentous Algae: None Green Orange  Brown Other	
Where are they located?	Floating Algae:	
Stream margii Pools Near riffles	None Brown Green Other	
'alittle in pools	[C \	
G. Sediment Appearance/Classification		
o.	USCS Classification	
Size: Material Type:	GW well graded gravel, fine to coarse gravel GP poorly graded gravel	
Substrate Deposition:	GM silty gravel	
Bottom Substrate/Available Cover:	GC clayey gravel	
Channel Alteration:	SW well graded sand, fine to coarse sand	
Channel Sinuosity:	SP poorly-graded sand	
Erosion: VM Bank Stability (LB & RB): BOTH EVOLUM	SM silty sand SC clavey sand	
Vegetated Buffer Zone Width: 2 5	ML silt	
ifany.	CL clay	
Notes Stream viring	OL organic silt, organic clay	
alittle turbed often	MH silt of high plasticity, elastic silt CH clay of high plasticity, fat clay	
van princip dens		
Pt peat Q Man Sevious/		
but up in headwall	Butoling	
and purt much	in a facting	

## **Wetland Sketch**

Note: Identify trees, shrubs, vegetation, grasses within stream bank and wetland areas



#### Notes:

Distances are measured from left bank looking downstream.

Use feature abbreviations from the following list, as shown in figure (WS refers to baseflow water surface):

TOLB - Top of left bank

BKP - Breakpoint

LCB - Left channel Bottom

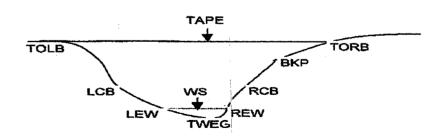
LEW - Left edge of water

TWEG - Thalweg

REW - Right edge of water

RCB - Right channel bottom

TORB - Top of right bank





Sumpling Location

### **ADDITIONAL NOTES**

will

minoral Trees noted along bencher

honey suckle

lov 2 sycamorus / lov 2 hop horn

ash, or Black gum

a few

lange 15 2 dia.

little if any Stream buffer

Very minimal Q,  $\angle 0.6 \text{ ft/s}$ wetterflow channel 6' x,  $25 = 1.5 \text{ ft}^2$ perimoter Q = 0.5 cfs flow i5-1 max cfs

- mot alot to note at this location, min. It trees, min. Q in stream, no buffer, creek is evoding elp. after heavy vain previous day.



Stream C	haracterization Form
Reach ID: 505W 03	Investigators: TC CTR
Weather: COURT 10 2  TYPE 1  Well developed baseflow and bankfull channel Consistent floodplain features easily identified Predictable chanel morphology One terrace apparent above active floodplain Floodplain covered by diverse vegetation Streambanks <= 45 degree	Stream: CWM Date: 5 4 (  TYPE 2  Headcuts Exposed cultural features (channel bottom) Sediment deposits absent or sparse Exposed bedrock (part of reach) Streambank slopes > 45 degree
TYPE 3  ☐ Streambank sloughing ☐ Sloughed material eroding ☐ Streambank slopes > 60degree or vertical/undercut/ ☐ Accelerated bend migration ☐ Erosion on inside of bends ☐ Exposed cultural features (channel banks) ☐ Exposed bedrock (majority of reach)	Streambank aggrading Sloughed material not eroded Sloughed material colonized by vegetation Described, bankfull and floodplain channel developing Predictable channel morphology developing Treambank slopes <= 45 degree  Gowl Sw
TYPE 5  Well developed baseflow and bankfull channel Consistent floodplain features easily identified Two terraces apparent above active floodplain Predictable chanel morphology Streambanks <= 45 degree	Notes D/S of site, hike thra woods
Dominant Substrate	Representative of % of total reach length  1. Clay 2. Silt 3. Sand 4. Gravel 5. Cobble  6. Boulder 7. Bedrock 8. Other (specify)
Comments Type 4, bu	it w/ alat of six
stable of wi moss	ling washed down degrading stream reach, seam were very stable in I note 2 terraces in vt. bould at some laces
so, this reach of before disturbed mentation D	of stream was stable 4-51 me u/s causing > Q & sedi-



Cross Section Data  Reach ID:	a service disableo veteran owned s				)	C00
X-Section  Distance from Left Bank (ft)  Left Bank (ft)  Feature Abbreviation				·	$\overline{}$	06-1
X-Section  Distance from Left Bank (ft)  Left Bank (ft)  Feature Abbreviation	Reach ID:	Investigators:		· · · · · · · · · · · · · · · · · · ·		Spete
X-Section  Distance from Left Bank (ft)  Left Bank (ft)  Feature Abbreviation	Date:	Watershed:	·	Stream		-6) nest
Left Bank (ft) (ft) Addreviation		X-Section			Feature	1
	İ		Left Bank (ft)	(ft)	Abbreviation	
						1
						1
		· · · · · · · · · · · · · · · · · · ·				-
				·		
			· · · · · · · · · · · · · · · · · · ·			
		1				
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		And the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s				



	In-Stream	Characteristics Form
Reach ID: 5	9W03	Investigators: JC CJR
Date: 5 4	11 1020	Watershed: Stream: Flownigum
A. Water Appearance		B. Water Odor
1. Clear	6. Dark Brown	1. Sewage 4. Rotten Eggs
☐ 2. Milky	7. Oily Sheer	2. Chlorine 5. None
3. Foamy	8. Reddish	3. Fishy
3. Foamy 4. Turbid Slight	9. Greenisł	
5. Light Brown	Other	Other
C. Sediment Odor		D. Fish
1. Sewage	4. Rotten Eggs	Xivone
	5. Oxidation	
2. Chlorine	5. Oxidation	Medium (3-6 in.)
3. Petroleum	Z. None	Large (7 in. & above)
·	Other	
E. Aquatic Plants	1	F. Algae Algae "slime" coating. None Light Heavy
Percent Area: 2%	<u> </u>	Color: Green Other
/ 1 - 10		
If present, are they. At	tached Free-flowing	Filamentous Algae: None Green Orange Brown Other
Mhere are they located	?	Floating Algae:
Stream margii Pool		None Brown Green Other
G. Sediment Appearar	nce/Classification	11000 01
Size:		<u>USCS Classification</u> ☐ <b>GW</b> well graded gravel, fine to coarse gravel
Material Type:		GP poorly graded gravel
Substrate Deposition:		GM silty gravel
Bottom Substrate/Available Channel Alteration:	e Cover:	☐ GC clayey gravel ☐ SW well graded sand, fine to coarse sand
Channel Sinuosiţy:	·/c	SP poorly-graded sand
irosion: Sedimote		SM silty sand
ank Stability (LB & RB):_		Se clayey sand
egetated Buffer Zone Wig	ith: 1700 [	ML silt Sup Soundly But CL clay
lotes	7	OL organic silt, organic clay
	1 ext 10	/ MH silt of high plasticity, elastic silt
	Max	
*	11	OH organic clay, organic silt Pt peat
VEVV SI	Ity in	Jeft Buffer lookingds
Savier	myoned	is Dump old vehicles
WW.	THINK:	in wiffice
V ^ / _!	1 C/1 raw	1/ 1/1/1/

## Wetland Sketch

Note: Identify trees, shrubs, vegetation, grasses within stream bank and wetland areas

eft 6' 4' rt side 160king D/S

#### Notes:

Distances are measured from left bank looking downstream.

Use feature abbreviations from the following list, as shown in figure (WS refers to baseflow water surface):

TOLB - Top of left bank

BKP - Breakpoint

LCB - Left channel Bottom

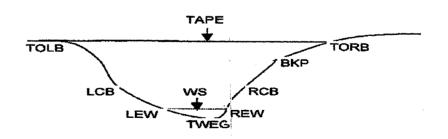
LEW - Left edge of water

TWEG - Thalweg

REW - Right edge of water

RCB - Right channel bottom

TORB - Top of right bank



5tream X-Secu

Sampling 63



# ADDITIONAL NOTES

Souphing Location

Trees, Mote of same
washing but noted This poplar, Box Elder
washing (substant), sy campice
alot in some
understant / smit Bender evoled in some
downant tree spots but w/veg,
tout
-part of stream well stabilized

- part of stream well stabilized but being impacted by all sedinent being washed down from gite US!

reducity 0.5-1 Ft/5

>Flow area 3'x.25' = .75 × 1 = 0.75 Pt/
wide depth ~ 1 cfs



Stream Cl	haracterization Form			
Reach ID: SOSWOY	Investigators: JK CJR			
Weather: Coudy Q20  TYPE 1  Well developed baseflow and bankfull channel Consistent floodplain features easily identified Predictable chanel morphology One terrace apparent above active floodplain Floodplain covered by diverse vegetation Streambanks <= 45 degree	Stream: Tempique Date: 5 4  TYPE 2  Headcuts Exposed cultural features (channel bottom) Sediment deposits absent or sparse Exposed bedrock (part of reach) Streambank slopes > 45 degree			
TYPE 3  Streambank sloughing Sloughed material eroding Streambank slopes > 60degree or vertical/undercut Accelerated bend migration Erosion on inside of bends Exposed cultural features (channel banks) Exposed bedrock (majority of reach)  TYPE 5  Well developed baseflow and bankfull channel Consistent floodplain features easily identified Two terraces apparent above active floodplain Predictable chanel morphology Streambanks <= 45 degree	TYPE 4  Streambank aggrading Sloughed material not eroded Sloughed material colonized by vegetation Baseflow, bankfull and floodplain channel developing Predictable channel morphology developing Streambank slopes <= 45 degree  Notes ACHIC Dawl CVS(ON EVIDLE)  MO Veg. on baully			
Representative of 90 % of total reach length 1. Clay 2 Silt 3. Sand 4. Gravel 5. Cobble 6. Boulder 7. Bedrock 8. Other (specify)  Comments  Thus is a good gravelly viffe  Als of pool @ Culvert, Pool Created  my vus that danged up stream  De of culvert craftell				
Soils ween scation below it in				



#### **Cross Section Data**

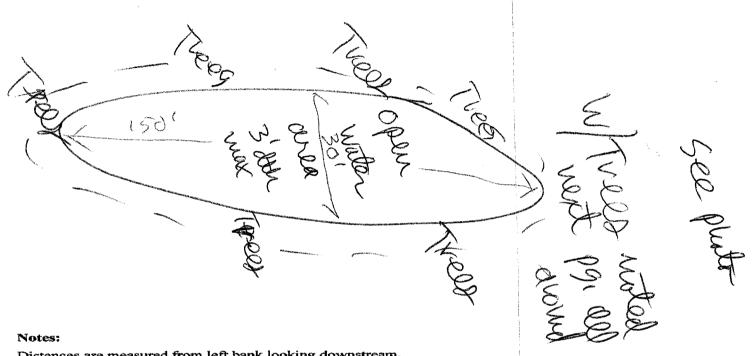
Reach ID:	: Investigators:		JA		
Date:	5/4/// Watershed:		Stream	: <u>Flenurgu</u>	lan
	X-Section	Distance from Left Bank (ft)		Feature	
	TOB	0 kg	16		
	,	1 (,25	311	Barla	1
		1 7 1	14"		
	Δ		26"	V	
	edge creek	1 ~ 1	46.5	TWEG	_
		5/3.6	43		
		6/35	465		
ŀ	edge civell	7 35	41	<u> </u>	
-		8 23	28	· · · · · · · · · · · · · · · · · · ·	
-		7 21	145		
F		10/20	44		
-		11/2/10	415		
-		12 6	70	D . O	
-		10 1.5	4	Benk	Note
	+12			Lawy	Flow meter
		16			SUSpect EV
<b> -</b>		M			Flow meter suspect is
<b>-</b>	Stream WIFlow	22" X	311	in aule	215H2
	DET Veloc	ity c	\5 0	F1/5/15/13/	minimal
		Action.	U . 0	47/7	1 1cfs max



In-Stream Characteristics Form				
Reach ID: 505	W 84	Investigators: JK	COR	
Date: 5/L	1/11, 930	Watershed:	Stream: Flowigan	
A. Water Appearance	11)	B. Water Odor	Tourdam (CEVWY/MAX	
1. Clear	6. Dark Brown	1. Sewage 4. R	otten Eggs	
2. Milky	7. Oily Sheer	2. Chlorine 5. N	one	
3. Foamy	8. Reddish	3. Fishy		
4. Turbid	9. Greenisf Other	Other		
5. Light Brown	11.3 NTUS	-   Other		
C. Sediment Odor		D. Fish		
1. Sewage	4. Rotten Eggs	None		
2. Chlorine	5. Oxidation			
3. Petroleum	6. None	Medium (3-6 in.)		
	Other	Large (7 in. & above)		
	Other			
E. Aquatic Plants		F. Algae		
Percent Area: 0% 1 10 9 f present, are they Att Where are they located Stream margi Pools	> 50% tached Free-flowing?	Filamentous Algae:  Floating Algae:	Light Heavy Green Other Green Orange Brown Other Green Other	
G. Sediment Appearant  Size:  Material Type: Substrate Deposition: Stottom Substrate/Available Channel Alteration: Channel Sinuosity: Trosion:  ank Stability (LB & RB):	• Cover:	GP poorly graded g GM silty gravel GC clayey gravel	vel, fine to coarse gravel ravel	, at sayple location
ML silt   CL clay   OL organic silt, organic clay   MH silt of high plasticity, elastic silt   CH clay of high plasticity, fat clay   OH organic clay, organic silt   Pt peat   Pt peat   OH organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic silt   OH organic clay, organic clay, organic silt   OH organic clay, organic clay, organic clay, organic clay, organic				

# **Wetland Sketch**

Note: Identify trees, shrubs, vegetation, grasses within stream bank and wetland areas



Distances are measured from left bank looking downstream.

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TOLB - Top of left bank

BKP - Breakpoint

LCB - Left channel Bottom

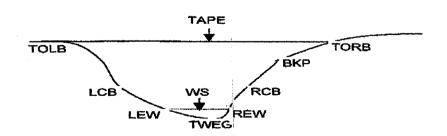
LEW - Left edge of water

TWEG - Thalweg

REW - Right edge of water

RCB - Right channel bottom

TORB - Top of right bank



ADDITIONAL NOTES

ADDITIONAL N

Trees around wind are bed. Creek & Tracks alotsy camore, Red maple, Sw 6 mm; Asher, hophorn beam, area ~ 30' x 150' area 2-3' more depth Swater BL 6 mm, which 6 mm & osher a nue water tolevant? I buttress truck of Sw 6 mm, in water so good veg, & hydrol, evidence of reminimum or hottan egg 5 mell rascular premiser premiser premiser premiser.



Stream Characterization Form			
Reach ID: 5D SW 0.6	Investigators: JK CTR		
Weather: Party Sunuy 70°  TYPE 1  Well developed baseflow and bankfull channel Consistent floodplain features easily identified Predictable chanel morphology One terrace apparent above active floodplain Floodplain covered by diverse vegetation Streambanks <= 45 degree	Stream: Founging Date: 5 3   1    TYPE 2   Headcuts   Exposed cultural features (channel bottom)   Sediment deposits absent or sparse   Exposed bedrock (part of reach)   Streambank slopes > 45 degree		
TYPE 3  ☐ Streambank sloughing ☐ Sloughed material eroding ☐ Streambank slopes > 60degree or vertical/undercut ☐ Accelerated bend migration ☐ Erosion on inside of bends ☐ Exposed cultural features (channel banks) ☐ Exposed bedrock (majority of reach)	TYPE 4  Streambank aggrading Sloughed material not eroded Sloughed material colonized by vegetation Baseflow, bankfull and floodplain channel developing Predictable channel morphology developing Streambank slopes <= 45 degree		
TYPE 5  Well developed baseflow and bankfull channel Consistent floodplain features easily identified Two terraces apparent above active floodplain Predictable chanel morphology Streambanks <= 45 degree	Notes		
Representative of % of total reach length 1. Clay 2. Silt 3. Sand 4. Gravel 5. Cobble 6. Boulder 7. Bedrock 8. Other (specify)			
	wet/and		

10 am

J.M.WALLER* ASSOCIATES, INC.

<b>~</b>		
Cross	Section	Data

	1.WALLER* SOCIATES, INC.	
a service disabled vete	RAN OWNED SMALL BUSINESS	Cross Section Dat
Reach ID:	nces	Investigators:
Date:		Watershed:

Stream:

			<del></del>
X-Section	Distance from Left Bank (ft)	Depth (ft)	Feature Abbreviation
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	·		
Address of the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s			



Algae "slime" coating   None   Clight   Heavy	In-Stream	Characteristics Form
1. Clear   G. Dark Brown   1. Sewage   4. Rotten Eggs   2. Chlorine   5. None   3. Fishy   3. Fishy   0ther	Reach ID: 5D5W06	Investigators: JK CTR
1. Clear   G. Dark Brown   1. Sewage   4. Rotten Eggs   2. Chlorine   5. None   3. Fishy   3. Fishy   0ther	Date: 5/3/11	Watershed: Stream:FlPinniaum
2. Milky	A. Water Appearance	B. Water Odor
3. Foamy	1. Clear 6. Dark Brown	1. Sewage 4. Rotten Eggs
d. Turbid   g. Greenist   Other   Other	2. Milky 7. Oily Sheer	2. Chlorine \$\infty\$5. None
Steem margin   Pools   Near riffles	3. Foamy 8. Reddish	
C. Sediment Odor  1. Sewage 2. Chlorine 5. Oxidation Other    Medium (3-6 in.)   Large (7 in. & above)   Large (1 in. Large (1 in. Large (1 in. Large (1 in. Large (1 in. Larg	4. Turbid 9. Greenist	L 3. FISHY
1. Sewage	5. Light Brown Other	Other
2. Chlorine	2 (-1 (1/4) (-1	D. Fish
Stream margii   Pools   Near riffles   Now   Waterial Type:   Substrate Deposition:   Size:   GR will graded gravel, fine to coarse gravel   GC clayey gravel   Stockharles   Substrate Available Cover:   Sw well graded sand, fine to coarse sand   Sm glave   Stream slith gravel   Stockharles   Stephank Stability (LB & RB):   Vegetated Buffer Zone Width:   Stockharles   Stockhar	1. Sewage 4. Rotten Eggs	None
Stream margi	2. Chlorine 5. Oxidation	Small (1-2 in.)
Color:   Brown   Green   Other     Green   Other     Green   Other     Green   Other     Green   Other     Green   Other	☐6 None	Medium (3-6 in.)
E. Aquatic Plants  Percent Area   0%		Large (7 in. & above)
Algae "slime" coating   None   Clight   Heavy	Other	
Color:   Brown   Green   Other	E. Aquatic Plants	F. Algae
If present, are they. Attached   Free-flowing   Brown Other   Where are they located?   Stream margii   Pools   Near riffles   Floating Algae:   Floating Al	1 - 10 % 30 - 50 %	Color: Green Other
Stream margii Pools Near riffles  Nowe with Mean Shaves  G. Sediment Appearance/Classification  Size:	If present, are they. Attached Free-flowing	Brown Other
G. Sediment Appearance/Classification  Size:		
G. Sediment Appearance/Classification  Size:		Storic Green Other
USCS Classification		
GW well graded gravel, fine to coarse gravel   GP poorly graded gravel   GP poorly graded gravel   GP poorly graded gravel   GM silty gravel   GC clayey gravel   GC clayey gravel   SW well graded sand, fine to coarse sand   SW well graded sand, fine to coarse sand   SP poorly-graded sand   SM silty sand   SC clayey sand   SC	G. Sediment Appearance/Classification	USCS Classification
Substrate Deposition:  Bottom Substrate/Available Cover:  Channel Alteration:  Channel Sinuosity:  Bank Stability (LB & RB):  Vegetated Buffer Zone Width:  Notes  Notes  SM silty gravel  GC clayey gravel  SW well graded sand, fine to coarse sand  SP poorly-graded sand  SM silty sand  P V-CC Will Manual  SC clayey sand  ML silt  CL clay  OL organic silt, organic clay  MH silt of high plasticity, elastic silt  CH clay of high plasticity, fat clay  OH organic clay, organic silt	Size:	
Bottom Substrate/Available Cover:  Channel Alteration:  Channel Sinuosity:  Brosion:		GP poorly graded gravel
Channel Alteration: Channel Sinuosity: SW well graded sand, fine to coarse sand SP poorly-graded sand SM silty sand SC clayey sand ML silt CL clay OL organic silt, organic clay MH silt of high plasticity, elastic silt CH clay of high plasticity, fat clay OH organic clay, organic silt		
Channel Sinuosity:  Frosion:  Bank Stability (LB & RB):  Cyclegetated Buffer Zone Width:  Notes  Notes  Notes  Notes  Channel Sinuosity:  SP poorly-graded sand  Note Silty sand  Note Stability (LB & RB):  Chank Stability (LB & RB):  Chank Silty sand  Note Stability (LB & RB):  Chank Silty sand  Chan		Name of the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second seco
SM silty sand Procodition  Bank Stability (LB & RB):  Gegetated Buffer Zone Width:  ML silt  CL clay  OL organic silt, organic clay  MH silt of high plasticity, elastic silt  CH clay of high plasticity, fat clay  OH organic clay, organic silt		parenty .
SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   SC c		SN eitheand
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Notes  No Juanual  OL clay  OL organic silt, organic clay  MH silt of high plasticity, elastic silt  CH clay of high plasticity, fat clay  OH organic clay, organic silt		
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UH organic clay, organic silt	Notes No Jamel,	
UH organic clay, organic silt	wetland area	CH clay of high plasticity, fat clay
inthial alocator year		Annahus .
A. I IVAK homen	- without plants yes	
many cultured & Yellow Flag, & sedger	marrly cathail 2 Yol	low Flog, & sedan.

## **Wetland Sketch**

Note: Identify trees, shrubs, vegetation, grasses within stream bank and wetland areas

8 Coly

photos show best

PWE

#### Notes:

Distances are measured from left bank looking downstream.

Use feature abbreviations from the following list, as shown in figure (WS refers to baseflow water surface):

TOLB - Top of left bank

BKP - Breakpoint

LCB - Left channel Bottom

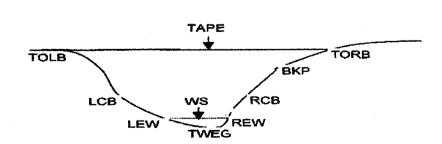
LEW - Left edge of water

TWEG - Thalweg

REW - Right edge of water

RCB - Right channel bottom

TORB - Top of right bank



while confused to valling and bet vailroad & Bomb often 2De J.M.WALLER' ASSOCIATES, INC ADDITIONAL NOTES Trees along etter side include Red Maple, Box Elde 1 Hop hombean I Willow hamping in creek, Smetch Stranore whand predominolog by cartail (navvour leaf) (Yellow Flower Plant Voit) Retent Yellow Flag-anea from area to sampling pt invasive sport Max area 300'x 400' = 12000ft area 1/4 ac. including cheets, s.w., sat soils on edge - Sweet weed on edge creed with - 5 tarted photos at circle/ut/hd confluence & head Down into wither area. mucky, brown, obset. soils - water Stained leaves to toe of slope, evidence of part Flooding, water - on little island area mean sample ft. paw Spike rush, wint, Erevis, some other small - could not pick up any precioced flew of eith sampling to cateur or a confluence of creek, strong head und against F/OW also made a est duf.

sampling Location & whiled



almost variebait, spring boxes other side rd.

Stream C	haracterization Form
Reach ID: SWSD OF	Investigators: TK CTR
Weather: Cloudy	Stream: FLOWING WM Date: 5/3/1/
Well developed baseflow and bankfull channel Consistent floodplain features easily identified Predictable chanel morphology One terrace apparent above active floodplain Floodplain covered by diverse vegetation Streambanks <= 45 degree	Headcuts Exposed cultural features (channel bottom) Sediment deposits absent or sparse Exposed bedrock (part of reach) Streambank slopes > 45 degree
TYPE 3  Streambank sloughing BY VOOL Streambank slopes > 60degree or vertical/undercut Accelerated bend migration Erosion on inside of bends Exposed cultural features (channel banks) Exposed bedrock (majority of reach)	TYPE 4  Streambank aggrading  Sloughed material not eroded  Sloughed material colonized by vegetation  Baseflow, bankfull and floodplain channel developing  Predictable channel morphology developing  Streambank slopes <= 45 degree
TYPE 5  Well developed baseflow and bankfull channel Consistent floodplain features easily identified Two terraces apparent above active floodplain Predictable chanel morphology Streambanks <= 45 degree	Notes
Assigned CEM Type  Dominant Substrate  Stream Hembo  Comments Were mae Stable  Just D/S from Sau  160011001.	The Campbell
We are works	
forther by	vol), more erosion



Reach ID:	Cross Section  5W5D89 Investigators:  Watershed:	Data JK	CJ		
Date:	5[3[[ Watershed:		Stream	n: Flennige	<b>1</b>
· #	X-Section	Distance from Left Bank (ft)		Feature Abbreviation	
Ar Ar		0	0	TOB	
•		1	0.5	Baula	
·		2	1.25	7	_
-		3	2.5	left edge.	of shear (10
-		4	23		d wa
-		5	2.4	TWEG	
		6	2.2		
-	1		2.2		
		8	4,9	vst. edge	
F		10	1.1	Bank	
F	· · · · · · · · · · · · · · · · · · ·	11	0.3	Bauk	Maria Maria
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		12		-(VD	
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F					
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In-Stream Characteristics Form   Reach ID:   SWS   OR   Investigators:   Stream: Flexividy   To John   Stream: Flexividy   T		
Date:     3       3   0	In-Stream	1 Characteristics Form
A. Water Appearance   C. Clear	Reach ID: SWSO OR	Investigators: JK CJR
A Water Appearance	Date: 5311 1310	Watershed: Stream: Flewydun
2. Milky	A. Water Appearance	B. Water Odor
3. Foamy   9. Greenist   9.	1. Clear 6. Dark Brown	1. Sewage 4. Rotten Eggs
3. Foamy   9. Greenist   9.	2. Milky 7. Oily Sheer	2. Chlorine 5. None
S. Light Brown	The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s	
C. Sediment Odor  1. Sewage	4. Turbid 9. Greenisi	J 3. Fishy
1. Sewage	5. Light Brown Other	Other
1. Sewage		
Small (1-2 in.)   M { M \ 0 W S   Mole   Medium (3-6 in.)   Large (7 in. & above)	C. Sediment Odor	D. Fish
3. Petroleum	1. Sewage 4. Rotten Eggs	
3. Petroleum	2. Chlorine 5. Oxidation	Small (1-2 in.) WY WVOWS
Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   Cother   C	None	
E. Aquatic Plants  Percent Area:   0%	/	Large (7 in. & above)
Algae "slime" coating None   Clight   Heavy Color:   Brown   Green   Other	Other	-
Color:   Brown   Green   Other   Filamentous Algae:   None   Green   Orange   Filamentous Algae:   None   Green   Other	E. Aquatic Plants	F. Algae
Filamentous Algae:	□ 10 20 W	Algae "slime" coating None Light Heavy
Filamentous Algae:   None   Green   Orange   Brown Other   Stream margii   Pools   Near riffles   Floating Algae:   None   Brown Other   Floating Algae:   None   Strategie   N	Percent Area:	Color: Gréen Other
Free-flowing   Stream margin   Pools   Near riffles   Floating Algae:   None   Brown   Green   Other		Filamentous Algae: MNone Green Grange
Stream margin	If present, are they Attached Free-flowing	Brown Other
G. Sediment Appearance/Classification  Size: GW well graded gravel, fine to coarse gravel Material Type: GP poorly graded gravel Substrate Deposition: GC clayey gravel Gottom Substrate/Available Cover: GC clayey gravel Channel Alteration: SW well graded sand, fine to coarse sand Channel Sinuosity: SP poorly-graded sand Grosion: SM silty sand SC clayey sand ML silt CL clay OL organic silt, organic clay MH silt of high plasticity, elastic silt CH clay of high plasticity, fat clay OH organic clay, organic silt Pt peat	where are they located?	Floating Algae:
Size:   GW well graded gravel, fine to coarse gravel   GP poorly graded gravel   GP poorly graded gravel   GM silty gravel   GC clayey gravel   GC clayey gravel   SW well graded sand, fine to coarse sand   SP poorly-graded sand, fine to coarse sand   SP poorly-graded sand   SP poorly-graded sand   SM silty sand   SC clayey sand   SC clayey sand   SC clayey sand   SC clayey sand   ML silt   CL clay   OL organic silt, organic clay   MH silt of high plasticity, elastic silt   CH clay of high plasticity, fat clay   OH organic clay, organic silt   Pt peat	Stream margii Pools Near riffles	None Brown Green Other
Size:   GW well graded gravel, fine to coarse gravel   GP poorly graded gravel   GP poorly graded gravel   GM silty gravel   GC clayey gravel   GC clayey gravel   SW well graded sand, fine to coarse sand   SP poorly-graded sand, fine to coarse sand   SP poorly-graded sand   SP poorly-graded sand   SP poorly-graded sand   SM silty sand   SC clayey sand   SC clayey sand   SC clayey sand   ML silt   CL clay   OL organic silt, organic clay   MH silt of high plasticity, elastic silt   CH clay of high plasticity, fat clay   OH organic clay, organic silt   Pt peat	G. Sediment Appearance/Classification	1
Material Type: GP poorly graded gravel Substrate Deposition: GM silty gravel Gottom Substrate/Available Cover: GC clayey gravel Channel Alteration: SW well graded sand, fine to coarse sand SP poorly-graded sand SP poorly-graded sand SP poorly-graded sand SP poorly-graded sand SC clayey sand ML silt CL clay OL organic silt, organic clay MH silt of high plasticity, elastic silt CH clay of high plasticity, fat clay OH organic clay, organic silt Pt peat		
Substrate Deposition:  Bottom Substrate/Available Cover:  Channel Alteration:  Channel Sinuosity:  Brosion:  Brosion		
GC clayey gravel Sw well graded sand, fine to coarse sand Sp poorly-graded sand Sp poorly-graded sand Shank Stability (LB & RB): Hable Oksawplung Clayey sand Segetated Buffer Zone Width: NOT AWY CL clay  Notes Down Will CL clay OL organic silt, organic clay MH silt of high plasticity, elastic silt CH clay of high plasticity, fat clay OH organic clay, organic silt, organic silt, organic clay OH organic clay, organic silt Pt peat	Material Type:	
Channel Alteration: Channel Sinuosity: Channel Sinu		
SM silty sand Sc clayey sand ML silt CL clay OL organic silt, organic clay MH silt of high plasticity, elastic silt CH clay of high plasticity, fat clay OH organic clay, organic silt OH organic clay, organic silt Pt peat		<del></del>
SC clayey sand  //egetated Buffer Zone Width: Not ANY   SC clayey sand  //egetated Buffer Zone Width: Not ANY   ML silt  CL clay  OL organic silt, organic clay  MH silt of high plasticity, elastic silt  CH clay of high plasticity, fat clay  OH organic clay, organic silt  Pt peat		
Vegetated Buffer Zone Width: NOT ANY   ML silt   CL clay   OL organic silt, organic clay   MH silt of high plasticity, elastic silt   CH clay of high plasticity, fat clay   OH organic clay, organic silt   Pt peat   Pt peat	Erosion:	SM slity sand
Notes DOWN While T	Vegetated Buffer Zone Width: NOT ANY	
Why below samp with or high plasticity, elastic silt CH clay of high plasticity, fat clay OH organic clay, organic silt Pt peat		
Why below samp with or high plasticity, elastic silt CH clay of high plasticity, fat clay OH organic clay, organic silt Pt peat	lotes DOWN WYLL I	, =
Wy area) Sand Pt peat	Λ Λ	MH silt of high plasticity, elastic silt
(M) Wall Sault   Pt peat		
gravely migenting	1 / 00 - 10 - 10 - 10 - 10 - 10 - 10 - 1	
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inder samparal in tell boy ever	noter Sampling and	xed bog everything

### **Wetland Sketch**

Note: Identify trees, shrubs, vegetation, grasses within stream bank and wetland areas

3

#### Notes:

Distances are measured from left bank looking downstream.

Use feature abbreviations from the following list, as shown in figure (WS refers to baseflow water surface):

TOLB - Top of left bank

BKP - Breakpoint

LCB - Left channel Bottom

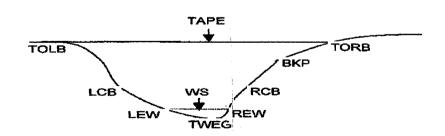
LEW - Left edge of water

TWEG - Thalweg

REW - Right edge of water

RCB - Right channel bottom

TORB - Top of right bank



J.M.WALLER SOLWING
ASSOCIATES, INC.
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OCHOR ADDITIONAL NOTES THEORY WELL ONLY

Stream bould only Vega trees only on viti side steam when boding D/S a mix of Sycanure, Red Maple, Asher 15w Gury Liburnium, hop hormbeam, BL Gum, Stream CEM 324, mostly 4, 3) Further DB by road _ Ferms, grasses, clearweed in Fld plann area alat mal Q in stream and! not a lot alot varied out!

alater vain , almost varied out!

alater vain , eg: buffer yes, but not a lot trees wetted perimeter =  $5^{1} \times .25^{1} = 1.25 + 12$ Q =  $1.25 + 12 \times 1 + 12 = 12$ How, vel, 1 ft/s 5 across aren= 1,25+12 depter, 251 Q=1,25. ~1 ft3/5 2max. wateh a increased after heavy rain & water turned turn. I



Lat rulen stream

1150

Stream C	haracterization Form						
Reach ID: 505WØ9	Investigators: TK CTR						
Weather:	Stream: FLONNGUN Date: 5/3/11						
TYPE 1	TYPE 2						
Well developed baseflow and bankfull channel     Consistent floodplain features easily identified     Predictable chanel morphology     One terrace apparent above active floodplain     Floodplain covered by diverse vegetation     Streambanks <= 45 degree	Well developed baseflow and bankfull channel Consistent floodplain features easily identified redictable chanel morphology   Exposed cultural features (channel bottom)   Sediment deposits absent or sparse   Exposed bedrock (part of reach)   Streambank slopes > 45 degree						
TYPE 3	TYPE 4						
Streambank sloughing	Streambank aggrading						
Sloughed material eroding	Sloughed material not eroded						
Streambank slopes > 60degree or vertical/undercut  Accelerated bend migration	Sloughed material colonized by vegetation						
Erosion on inside of bends	Baseflow, bankfull and floodplain channel developing						
Exposed cultural features (channel banks)	Predictable channel morphology developing						
Exposed bedrock (majority of reach)	Streambank slopes <= 45 degree						
TYPE 5	Notes						
Well developed baseflow and bankfull channel  Consistent floodplain features easily identified  Two terraces apparent above active floodplain  Predictable chanel morphology  Streambanks <= 45 degree							
ssigned CEM Type ominant Substrate	Representative of % of total reach length 1. Clay 2. Silt 3. Sand 4. Gravel 5. Cobble 6. Boulder 7. Bedrock 8. Other (specify)						
omments Rvolled	Bembo at						
Stv. Dun	Bembo at cut, see photos						
Type 3 oring	@ Sampling location upstream to culvest						

	J.M.WALLER' ASSOCIATES, INC.		

sampling Location

## **Cross Section Data**

Reach ID: 505W09 Investigators: JK CJR

Date: 5/3/11 Watershed: Stream: FIPMNigam

				<i>U</i>
	X-Section	Distance from Left Bank (ft)	Depth (ft)	Feature Abbreviation
		0	0	TOB
		l	til	bank
		2	1.2	benda
		3	3.8	Streem
		4	385	
		5	43	TWEG
		Ø	4.2	TWEG TWEG TWEG
			4,2	TWEG
		9	4.0	
		9	3.75	
		OJ	3,5	Stream
L		(1	1,9	Sheark
L		12	1.3	bank
		13	1.0	bank
L		14	0	TOB
L				



In-Stream Characteristics Form					
Reach ID: 5W	SD Ø9	Investigators: JK CJR			
Date: 5 3 11	1150	Watershed: Stream: Flankighha			
A. Water Appearance	)	B. Water Odor			
1. Clear	6. Dark Brown	1. Sewage 4. Rotten Eggs			
2. Milky	7. Oily Sheer	2. Chlorine 5. None			
3. Foamy	8. Reddish	3. Fishy			
4. Turbid	9. Greenist				
5. Light Brown	Other	Other			
C. Sediment Odor		D. Fish			
1. Sewage	4. Rotten Eggs	□ None	·		
2. Chlorine	5. Oxidation	None $\downarrow \circ \lor 2$			
1	6. None	Medium (3-6 in.)	! 		
3. Petroleum		Large (7 in. & above)	-F.		
	Other				
E. Aquatic Plants		F. Algae			
	( <del>****</del> )	Algae "slime" coating None Light Heavy Color: Green Other			
Percent Area: 0%	10 - 30 %	Color: Green Other			
- 10 %	%	Filamentous Algae: None Green Orange			
If present, are they	tached Free-flowing	Brown Other			
Where are they located	?	Floating Algae:			
Stream margii	s Near riffles	None Brown Green Other			
G. Sediment Appearan	ice/Classification	USCS Classification			
Size:		GW well graded gravel, fine to coarse gravel			
Material Type:		GP poorly graded gravel			
Substrate Deposition: VJ Bottom Substrate/Available	<u> </u>	GM silty gravel			
Bottom Substrate/Available Channel Alteration: <u> </u>	e cover:	GC clayey gravel SW well graded sand, fine to coarse sand			
Channel Sinuosity:		SP poorly-graded sand			
Erosion:	\ / Ob /	SM silty sand			
Bank Stability (LB & RB):_ Vegetated Buffer Zone Wid	$\frac{\chi^2 V}{dth} \frac{10^4 \text{ MOV}}{2}$	SC clayey sand ML silt			
vegetated bullet Zolie Wit	TV TV	CL clay			
<u>Notes</u>		OL organic silt, organic clay			
	_ 1	MH silt of high plasticity, elastic silt			
	OF AK	<ul><li>CH clay of high plasticity, fat clay</li><li>OH organic clay, organic silt</li></ul>			
relocity	W - 17 FD	Pt peat			
velocity =	他人人分了!	sandin maning	$\Lambda$		
wetten	a note	2 January Janes	EN DX		
XOM	以ニノー	in reach same	My T		

## Wetland Sketch

Note: Identify trees, shrubs, vegetation, grasses within stream bank and wetland areas

50 me veg.

> evodel

#### Notes:

Distances are measured from left bank looking downstream.

Use feature abbreviations from the following list, as shown in figure (WS refers to baseflow water surface):

TOLB - Top of left bank

BKP - Breakpoint

LCB - Left channel Bottom

LEW - Left edge of water

TWEG - Thalweg

REW - Right edge of water

RCB - Right channel bottom

TORB - Top of right bank

TOLB
TORB
TORB
LCB
WS
RCB
TWEG

0.5 ft/s

De



ADDITIONAL NOTES
Bendy actively evoding, as per photos VPG, From culvert down steam is
Veg, v from culvert downsteam is
a lot of Sy comover, tulip poplas, faed Mapie
Some sort of common syrub Perton Vibrien
some sont of common shrub perton House
U TOWN A CITE OF A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COLL AND A COL
No vacular plants except ferms noted > Vibits see x-sec. data channel XSCC
seex-section Channel XSPC
looking uptream
THE LEFT TO M. Bench 12 13 14 5' 6' 7' 8' 9 10 11 12 13 14
0 14" 26.5" 45" 5052 50 56 48 45 42 23 184 12"
14" 26.5" 45" 5052 50 56 48 45 42 2318+ 12" 0"    [Nches ] Louicera" 16
- Honey suckle shrub very common in area
both sider creek resp. near cylvert
with don't nildle
Flow 7' surf 7'x.5'= 3.5ft ²
3 ft x 0, 5 ft/sec (1) ft3/5)
0-15 ft3/sec (1) ft3/5)

## SMOKEY MOUNTAIN SMELTERS KNOXVILLE, TENNESSEE

# September 2011 RI/FS Phase 4 Sampling Event

Sampling Logs Book 1 of 1



MANAGING THE VISION® | ENVIRONMENTAL | FACILITIES | LOGISTICS



MS/MSD

**Duplicate ID No.:** 

#### SOIL & SEDIMENT SAMPLE LOG SHEET

MANAGING THE VISION A SERVICE DISABLED VETERAN OWNED SMALL BUSINESS Page | of Mon Suelter Project Site Name: Sample ID No.: Sample Location: Project No.: Sampled By: C.O.C. No.: [] Surface Soil Subsurface Soil Type of Sample: √/ Sediment Low Concentration [] Other: High Concentration [] QA Sample Type: GRAB SAMPLE DATA: Date: 10 20 Time: WWW 11: Depth Interval Color Description (Sand, Silt, Clay, Moisture, etc.) DLBOWN Fine Organic muck that Method: Yoha Moisture a content Monitor Reading (ppm): COMPOSITE SAMPLE DATA: Description (Sand, Silt, Clay, Moisture, etc.) Time Date: Depth Interval Color Method: Monitor Readings (Range in ppm): SAMPLE COLLECTION INFORMATION: Analysis **Container Requirements** Collected PIASS 502 OBSERVATIONS / NOTES: MAP: 35.89562 W 083,95083 Circle if Applicable: Signature(s):



MANAGING THE VISION

#### **SOIL & SEDIMENT SAMPLE LOG SHEET**

Page () ZMZ8.DS/ Project Site Name: Sample ID No.: Sample Location: My Fmha Project No.: Sampled By: C.O.C. No.: [] Surface Soil Subsurface Soil -₹ Sediment Type of Sample: Other: Low Concentration [] High Concentration [] QA Sample Type: GRAB SAMPLE DATA: Date: 1 A 0 Thrown Method: 1000 Depth Interval Color Description (Sand, Silt, Clay, Moisture, etc.) time organic Wock / high DK Brown MOSPIN くらもつけ Monitor Reading (ppm): COMPOSITE SAMPLE DATA: Date: Time Depth Interval Color Description (Sand, Silt, Clay, Moisture, etc.) Method: Monitor Readings (Range in ppm): SAMPLE COLLECTION INFORMATION: Analysis **Container Requirements** Collected Other RCL. *a*1055 OBSERVATIONS / NOTES: N 35.89637 W083 9509Le Circle if Applicable: Signature(s): MS/MSD Duplicate ID No.:



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MANAGING THE VISION A SERVICE DISABLED VETERAN OWNED SMALL BUSINESS

#### **SOIL & SEDIMENT SAMPLE LOG SHEET**

Page 3 of Project Site Name: Sample ID No.: Sample Location: Project No.: Sampled By: C.O.C. No.: [] Surface Soil [] Subsurface Soil Type of Sample: Sediment VI Low Concentration ☐ Other: [] High Concentration [] QA Sample Type: GRAB SAMPLE DATA: Date: 9 3 6 Description (Sand, Silt, Clay, Moisture, etc.) Depth Interval Color Dr Ranc tive, were provel rocks, 56 Method: Monitor Reading (ppm): COMPOSITE SAMPLE DATA: Date: Time Depth Interval Color Description (Sand, Silt, Clay, Moisture, etc.) Method: Monitor Readings (Range in ppm): SAMPLE COLLECTION INFORMATION: Analysis **Container Requirements** Collected Other OBSERVATIONS / NOTES: MAP N. 35. 89711 W 083.95103 Circle if Applicable: MS/MSD Duplicate ID No.:



MANAGING THE VISION A SERVICE DISABLED VETERAN OWNED SMALL BUSINESS

#### **SOIL & SEDIMENT SAMPLE LOG SHEET**

Mt. Suche Sample ID No.: Æ Project Site Name: Project No.: Sample Location: Sampled By: [] Surface Soil C.O.C. No.: Subsurface Soil
Sediment Type of Sample: [] Other: Low Concentration ¶ QA Sample Type: ∏ High Concentration GRAB SAMPLE DATA: Depth Interval Color Description (Sand, Silt, Clay, Moisture, etc.) More consc organic motoral, fine Bit, little NC. Brown 36 n Method: Para Monitor Reading (ppm): COMPOSITE SAMPLE DATA: Depth Interval Color Description (Sand, Silt, Clay, Moisture, etc.) Method: Monitor Readings (Range in ppm): SAMPLE COLLECTION INFORMATION: **Analysis** Container Requirements Collected Other MLIN OBSERVATIONS / NOTES: 10.35.89801 w,083.95148 Circle if Applicable: Signature(s): MS/MSD **Duplicate ID No.:** 



MANAGING THE VISION A SERVICE DISABLED VETERAN OWNED SMALL BUSINESS

**SOIL & SEDIMENT SAMPLE LOG SHEET** 

Swolay Utn. Sweller Project Site Name: Sample ID No.: Project No.: Sample Location: Sampled By: Surface Soil C.O.C. No.: [] Subsurface Soil Sediment Type of Sample: [] Other: **↓** Low Concentration [] QA Sample Type: High Concentration GRAB SAMPLE DATA: Date: O O O Description (Sand, Silt, Clay, Moisture, etc.) Depth Interval Color Time: 13: 37 PM
Method: Tong a5" More coarse about Motor DC Brown Monitor Reading (ppm): COMPOSITE SAMPLE DATA: Date: Time Depth Interval Color Description (Sand, Silt, Clay, Moisture, etc.) Method: Monitor Readings (Range in ppm): SAMPLE COLLECTION INFORMATION: **Analysis Container Requirements** Collected Other 8 Oc. 22010 OBSERVATIONS/NOTES: N. 35.89890 W. 083.9500l Flow Meton: Oth Circle if Applicable: Signature(s): MS/MSD **Duplicate ID No.:** 



MANAGING THE VISION

#### **SOIL & SEDIMENT SAMPLE LOG SHEET**

Page (O of Min. Suetter Project Site Name: Sample ID No.: Project No.: Sample Location: ` Sampled By: Delma C.O.C. No.: Surface Soil Subsurface Soil Sediment Type of Sample: [] Other: Low Concentration QA Sample Type: [] High Concentration GRAB SAMPLE DATA: Date: U lace 1) Description (Sand, Silt, Clay, Moisture, etc.) Depth Interval  $u^{\overline{v}}$ 13: 83 PM Time: DC. Brown Fine, silty, organic Method: 1000000 Monitor Reading (ppm): COMPOSITE SAMPLE DATA: Date: Depth Interval Color Description (Sand, Silt, Clay, Moisture, etc.) Method: Monitor Readings (Range in ppm): SAMPLE COLLECTION INFORMATION: **Analysis Container Requirements** Collected Other Un ITA Metals 802.965 ion OBSERVATIONS / NOTES: D. 35.89991 W. 083. 95008 Avg Speed: Haw Motor: O. Campt Circle if Applicable: Signature(s): MS/MSD **Duplicate ID No.:** 





MANAGING THE VISION" A SERVICE DISABLED VETERAN OWNED SMALL BUSINESS

#### **SOIL & SEDIMENT SAMPLE LOG SHEET**

Subras min swellow Project Site Name: Sample ID No.: Project No.: Sample Location: Sampled By: C.O.C. No.: ∏ Surface Soil Subsurface Soil Sediment Type of Sample: MSLMSD Low Concentration QA Sample Type: | High Concentration GRAB SAMPLE DATA: 413(911 Description (Sand, Silt, Clay, Moisture, etc.) Date: Depth Interval Color then last of fine over 1-4" Time: Method: thick clay, sort for a Monitor Reading (ppm): COMPOSITE SAMPLE DATA: Depth Interval Color Description (Sand, Silt, Clay, Moisture, etc.) Method: Monitor Readings (Range in ppm): SAMPLE COLLECTION INFORMATION: Other **Container Requirements** Collected Vols annonia 80C.005.20 OBSERVATIONS / NOTES: -las of Spents Minnows 10.35.90745 W 083 94339 Circle if Applicable: Signature(s): Duplicate ID No.: MS/MSD How meter: 7.2 mph (avg.



MANAGING THE VISION A SERVICE DISABLED VETERAN OWNED SMALL BUSINESS

### SOIL & SEDIMENT SAMPLE LOG SHEET $_{\rm Cl}$

Project Site Name: Sample ID No.: Project No.: Sample Location Sampled By: C.O.C. No.: Surface Soil Subsurface Soil √ Sediment Type of Sample: Low Concentration Other: High Concentration [] QA Sample Type: GRAB SAMPLE DATA: 9/27/11 Depth Interval Color Description (Sand, Silt, Clay, Moisture, etc.) Method: Mand woo Monitor Reading (ppm): COMPOSITE SAMPLE DATA: Date: Time Depth Interval Description (Sand, Silt, Clay, Moisture, etc.) Color Method: Monitor Readings (Range in ppm): SAMPLE COLLECTION INFORMATION: Container Requirements Collected Other <u> SO R</u> JAN 1291 OBSERVATIONS / NOTES: N. 35.90567 W 083, 94463 Circle if Applicable: Signature(s): MS/MSD **Duplicate ID No.:** 

Fran: 9.97 may (ovg. Speed)



MANAGING THE VISION A SERVICE DISABLED VETERAN OWNED SMALL BUSINESS

#### **SOIL & SEDIMENT SAMPLE LOG SHEET**

Smokey Mto sneller Sample ID No.: Project Site Name: Project No.: Sample Location: 4 Sampled By: Surface Soil C.O.C. No.: Subsurface Soil ✓ Sediment Type of Sample: Other: Low Concentration [] QA Sample Type: High Concentration GRAB SAMPLE DATA: Date: 9 31 1 Time: 10 58 AM Description (Sand, Silt, Clay, Moisture, etc.) Depth Interval Color Mestbonic fine little Clar Method: hand (1000) Monitor Reading (ppr(1)) COMPOSITE SAMPLE DATA: Description (Sand, Silt, Clay, Moisture, etc.) Date: Depth Interval Color Time Method: Monitor Readings (Range in ppm): SAMPLE COLLECTION INFORMATION: Analysis Container Requirements Collected Other TAD WARDL OBSERVATIONS / NOTES: MAP 35.90798 Circle if Applicable: Signature(s): MS/MSD Duplicate ID No.:

poded over 30' long w/ nipples
Flav: (7,9 mps)
(aug. Speed)



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#### **SOIL & SEDIMENT SAMPLE LOG SHEET**

			<u> </u>		. 434	<u> </u>	
Project Site Nam Project No.:  Surface Soi Subsurface Sediment Other:  A Sample	l Soil	SMOKey Freldch	Mth Smot plicate		ocation: By: Delmi	1K-6m	10 24/202M
GRAB SAMPLE DATA	Maria de la companya						
Method: YOY (A) Monitor Reading (pan)	);	Depth Interval	JC Grown	1	Sand, Silt, Clay, Moist		iel
COMPOSITE SAMPLE	DATA						
Date:	Time	Depth Interval	Color	Description	(Sand, Silt, Clay, Moist	ure, etc.)	
			'				
Method:					State of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state	*	- :
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Monitor Readings							may)
(Range in ppm):							
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SAMPLE COLLECTIO	ki injecionia:	l Man see see see see see see see see see se					
Salar Pri Occiseo 110	Analysis , )		Container Requi	ements	Collected	Other	
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DBSERVATIONS / NO	TES:			MAP.			
N35	CIP.	21		·			:
N 963	02	0 - 3					- :
	COLO	453		•			
							4
							***
Circle if Applicable:				Signature(s):	·		· *;
MS/MSD (	Duplicate II	D NO.:) SMSSD	[LAIPW	dal	the Ey	<u>`</u>	
				MA		<u>۱</u> (۱	11 14 12 4



Sample Location: Emboy went	Project /Project Number: Date: 13(0) 11				
Recorded By: Ward a Target of	Weather:				
Recorded By: Knisting Early	Site Conditions / Description of adjacent areas: (Include decription of submerged vegetation, bank vegetation/cover,				
Photograph #	Channelization, etc.)				
Approx. Stream Width: Farrallel to History dock	Jeciduais trees/shrobs.				
Approx. Stream Depth:					
Turbidity of Water:	<b>'</b>				
Approx. Surface Water Sample Collection Depth:					
l'below surface					

#### **KEY**

Organic Substrate: detritus (disintegrated coarse organic material: leaves, twigs, bark), muck/mud (fine, rich, loose organic soil), mart (lime-like material such as shells or limestone)

Inorganic Substrate: clay (plastic, ultra fine), silt (fine, smooth), sand (gritty, course), gravel (diameter 0.1 to 2.5 inches), cobble (diameter 2.5 to 10 inches), boulder (diameter > 10 inches)

Turbidity: clear, dull clarity (visibility through water 5+ft), clouded (visibility 2-5ft), highly turbulent (visibility < 2ft)

Odor: no odor, trace (intermittent odor near water surface), moderate (weak odor in breathing zone), strong (powerful odor throughout sample location)

Time	pH std. units	Temp degree C	Specific Condunctance uohms/cm	Turbidity NTU		ORP (mV)	Q (gpm)	Fernustron
11:03	7.75	# 9.47	357.0 357	21.3	8.41	188.3		0.05 mg/L

Comments:

N 35.89563

W 083, 95087

Note: 8 Duple 1 april 10 sted on FSP addsordum

Field Parameters recorded on 9/27/11

© 0933. Samples kept on its ones night

so temperature, and DO do not

reflect sample location,

Physiq 127/11



Sample Location: EMOOU WORL	Project /Project Number: Date: 9 Ole V
Recorded By: Kisting For	Site Conditions / Description of adjacent areas: (Include decription of submerged vegetation, bank vegetation/cover, Channelization, etc.)
Approx. Stream Width: France to end Fle	Decidious trees/shobs
Approx. Stream Depth: 53	
Turbidity of Water:	
Approx. Surface Water Sample Collection Depth:	
1' below surface	

#### **KEY**

Organic Substrate: detritus (disintegrated coarse organic material: leaves, twigs, bark), muck/mud (fine,

rich, loose organic soil), marl (lime-like material such as shells or limestone)

Inorganic Substrate: clay (plastic, ultra fine), silt (fine, smooth), sand (gritty, course), gravel (diameter 0.1 to

2.5 inches), cobble (diameter 2.5 to 10 inches), boulder (diameter > 10 inches)

Turbidity: clear, dull clarity (visibility through water 5+ft), clouded (visibility 2-5ft), highly turbulent (visibility < 2ft)

Odor:

no odor, trace (intermittent odor near water surface), moderate (weak odor in breathing zone), strong (powerful odor throughout sample location)

	Time	pH std. units	Temp degree C	Specific Condunctance uohms/cm	Turbidity NTU		ORP (mV)	Q (gpm)	ferrous Iron	7
1	11:22	8.01	6.36	354.0	19-8	8.94	210.0		0-55mg/L	
Ī	AM					•·		<u></u> .		

Comments:

N. 35.89637

W. 063. 9509Le S Parameters collected 2 0956 9/27111. Fremperature and Do are not reflecting conditions at sample location as samples have been Kept or ice overnight.

fux 9/37/10



Sample Location: EMboywort SWSSDSW (8	Project /Project Number: SMA(O) MW. SWO MP 9 9611
Recorded By:	Site Conditions / Description of adjacent areas: (Include decription of submerged vegetation, bank vegetation/cover,
Photograph #	Channelization, etc.)
Approx. Stream Width: Just beyond of	Decidous trees/strota
Approx. Stream Depth: 50	awares mes mog
Turbidity of Water:	
Approx. Surface Water Sample Collection Depth:	
" below surface	

#### **KEY**

Organic Substrate: detritus (disintegrated coarse organic material: leaves, twigs, bark), muck/mud (fine, rich, loose organic soil), marl (lime-like material such as shells or limestone)

Inorganic Substrate: clay (plastic, ultra fine), silt (fine, smooth), sand (gritty, course), gravel (diameter 0.1 to 2.5 inches), cobble (diameter 2.5 to 10 inches), boulder (diameter > 10 inches)

Turbidity: clear, dull clarity (visibility through water 5+ft), clouded (visibility 2-5ft), highly turbulent (visibility < 2ft)

Odor:

no odor, trace (intermittent odor near water surface), moderate (weak odor in breathing zone), strong (powerful odor throughout sample location)

Time	pH std. units	Temp degree C	Specific Condunctance uohms/cm	Turbidity NTU		ORP (mV)	Q (gpm)	Remostron 1
11:3	8.16	15.84	374.0	20.7	9.18	1933		0.01 mg/L

W. 083. 95103

Samples held overright on: ce- Temp and Pou do not reflect Dample (ocat in and the)

9(17)



Commission IV 1000	Desired (Desired Number)
Sample Location: Well The Dave 2	Project /Project Number: Date
< MACCOC > M	SNOW MAN SNOTH 9/36/11
SMSDSWM	Weather:
Recorded By:	Suny porty Javay
V	Site Conditions / Description of adjacent areas: (Include
motion tally	decription of submerged vegetation, bank vegetation/cover,
Photograph #	Channelization, etc.)
Approx. Stream Width: 140 UCs-Frank (UM) Approx. Stream Depth: 30 n	re Deciduous trees/shubs
Turbidity of Water:	
Approx. Surface Water Sample Collection Depth:	
1	
1'below State	

#### **KEY**

**Organic Substrate:** detritus (disintegrated coarse organic material: leaves, twigs, bark), muck/mud (fine,

rich, loose organic soil), marl (lime-like material such as shells or limestone)

Inorganic Substrate: clay (plastic, ultra fine), silt (fine, smooth), sand (gritty, course), gravel (diameter 0.1 to 2.5 inches), cobble (diameter 2.5 to 10 inches), boulder (diameter > 10 inches)

Turbidity: clear, dull clarity (visibility through water 5+ft), clouded (visibility 2-5ft), highly turbulent (visibility < 2ft)

Odor:

no odor, trace (intermittent odor near water surface), moderate (weak odor in breathing zone), strong (powerful odor throughout sample location)

Time	pH std. units	Temp degree C	Specific Condunctance uohms/cm	Turbidity NTU	DO (mg/L)	ORP (mV)	Q (gpm)	Ferrous from
12:15	8.03	13.99	532.0	27.2	49,17	200.4		0.33mg/L

**Comments:** 

N 35.89801

W 083.95148

9/27/11
Samples do not reflect location conditions as samples
buld over night on ice for 9/27/11



Sample Location: Wellond Ares	Project /Project Number:
SMSSDSWITO KE	Weather:
Recorded By:	Sund party classes
1/2. Forty	Site Conditions / Description of adjacent areas: (Include decription of submerged vegetation, bank vegetation/cover,
Photograph #	Channelization, etc.)
Approx. Stream Width:	
Approx. Stream Depth: 95	Doidous trees (Shrubs
Turbidity of Water:	
Approx. Surface Water Sample Collection Depth:	1
1' Bebu sonfice	

#### **KEY**

Organic Substrate: detritus (disintegrated coarse organic material: leaves, twigs, bark), muck/mud (fine,

rich, loose organic soil), marl (lime-like material such as shells or limestone)

Inorganic Substrate: clay (plastic, ultra fine), silt (fine, smooth), sand (gritty, course), gravel (diameter 0.1 to

2.5 inches), cobble (diameter 2.5 to 10 inches), boulder (diameter > 10 inches)

Turbidity: clear, dull clarity (visibility through water 5+ft), clouded (visibility 2-5ft), highly turbulent (visibility < 2ft)

Odor: no odor, trace (intermittent odor near water surface), moderate (weak odor in breathing zone), strong (powerful odor throughout sample location)

Time	pH std. units	Temp degree C	Specific Condunctance uohms/cm	Turbidity NTU	DO (mg/L)	ORP (mV)	Q (gpm)
13:30 PM	7.91	13.95	Q75.0	55.2	8.90	205.8	

Comments:

N 35.89890 W 083.95del

Flow neto: O. 22 MAI (avg. speed)

V9/27/11 Samples held on ice oner what - Temp- and 80 not offeetre sample location.



Sample Location:	Project /Project Number: Date: 9 30 11
SMSSDSWIS	Weather:
Recorded By:	
Kristino tony	Site Conditions / Description of adjacent areas: (Include decription of submerged vegetation, bank vegetation/cover,
Photograph #	Channelization, etc.)
Approx. Stream Width:	
	Decidous trees/shubs
Approx. Stream Depth:	1, my
[	
Turbidity of Water:	
Approx. Surface Water Sample Collection Depth:	
1' Below Surface	
I BEION SUMPLE	
<u> </u>	<u>                                     </u>

#### **KEY**

Organic Substrate: detritus (disintegrated coarse organic material: leaves, twigs, bark), muck/mud (fine, rich, loose organic soil), marl (lime-like material such as shells or limestone)

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Turbidity: clear, dull clarity (visibility through water 5+ft), clouded (visibility 2-5ft), highly turbulent (visibility < 2ft)

Odor:

no odor, trace (intermittent odor near water surface), moderate (weak odor in breathing zone), strong (powerful odor throughout sample location)

Time	pH std. units	Temp degree C	Specific Condunctance uohms/cm	Turbidity NTU	DO (mg/L)	ORP (mV)	Q (gpm)
12:49	7.73	31.05	776.0	369	8.58	2172	

Ferrowlron 0.29

Comments:

N 35.89991 Flaw weter:
W 0 83.95008 O.OR mph (ovg. spoods)

2 (27/11 Samples held on it one What Jamps.

and to not reflective of Sample locations

L

WALLER' DROWN SURFACE WATER

A MEROVEE DISABLED VETERANDIMINED SMALL RUCINESS PUR OF BY	PLING LOG
Sample Location: SKG	Project /Project Number: Date:
SMS SDS~ 91	Weather:
Recorded By:	Clady
Missing En	Site Conditions / Description of adjacent areas: (Include decription of submerged vegetation, bank vegetation/cover,
Photograph #	Channelization, etc.)
1	1 - many anatomods/smans
Approx. Stream Width:	- many gostropods/smonts - for out of lear later
	- MIN of Cray, Soro,
Approx. Stream Depth:	angel
<u> </u>	Un so Why
Turbidity of Water:	- Mix of cray, soro,  anal  - coins spar bla  2 rither moss
Approx. Surface Water Sample Collection Depth:	1 1 20 1 20 5 (W 0) M
	- decidos treez (rading)
1" below surface	- decidos frees (wolnut, mopre, box elar).
L	SWODS & MADRICOS VEGETALIA
	KEY (doning) . Cons. Privet fence
Organic Substrate: detritus (disintegrated coarse organich, loose organic soil), marl (lime	KEY (dow/mont, comp privet/ewel nic material: leaves, twigs, bark), muck/mud (fine, weed) -like material such as shells or limestone)
Inorganic Substrate: clay (plastic, ultra fine), silt (fine, si 2.5 inches), cobble (diameter 2.5 to	mooth), sand (gritty, course), gravel (diameter 0.1 to o 10 inches), boulder (diameter > 10 inches)
<u>Turbidity:</u> clear, dull clarity (visibility through water 5+ft), c	clouded (visibility 2-5ft), highly turbulent (visibility < 2ft)
Odor: no odor, trace (intermittent odor near water sur	face), moderate (weak odor in breathing zone),
strong (powerful odor throughout sample location	
Specific	<del></del>
pH Temp Condunctance	Turbidity Ferrous (ras
Time std. units degree C uohms/cm	NTU DO (mg/L) ORP (mV) Q (gpm)
9532 7.98 10.62 521.0	1.88 9.20 206.2 0.22 mg/L
VE	<del>                                                      _     _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _  </del>
Comments: N. 35, 901 \$ 65	ms/msD
W.083.943	39
70.0 O. 115	
	KE
Haw noto:	onerwylut on ice - Temp. to jample and its fr
No lo sul Soundie 10	I merulat on ica Terra +
1177/11 samples wie	and Conditions
bo not reflected of S	simple similar
	· · · · · · · · · · · · · · · · · · ·



Sample Location:	Project /Project Number: Date:
8MCSISINIA	Suda Into Swatter 40 114
Doorded Bij	Weather:
Recorded By:	Site Conditions / Description of adjacent areas: (Include
Mustro For	decription of submerged vegetation, bank vegetation/cover,
Photograph #	Channelization, etc.)
P notograph #	
	- Steep banks (5-8)
Approx. Stream Width:	
٠, ا	[ \\ \( VOV \con \con \con \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\
	- VET: FORE GROSSIS, Slighth is local)
Approx. Stream Depth:	do da sos es de sos de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra dela contra de la contra del la contra de la contra del la contra del la contra de la contra de la contra del la contra del la contra de la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra
4-9"	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Turbidity of Water:	The all of the common
Turblancy of water.	boxeldo, red maple, and
	1 My Ous who
Approx. Surface Water Sample Collection Depth:	1 company
2 1 1 2 2 CC (a)	-loss of pools, niffles, small
2" below surface	116-6116
	I WATER LOVELY.
	LETTON SUBSTATION MAKE THAT
Organic Substrate: detritus (disintegrated coarse orga	anic material: leaves, twigs, bark), muck/mud (fine, SDSIN)
	e-like material such as shells or limestone)
,	-lac Dlow
Inorganic Substrate: clay (plastic, ultra fine), silt (fine, s	mooth), sand (gritty, course), gravel (diameter 0.1 to
2.5 inches), cobble (diameter 2.5	to 10 inches), boulder (diameter > 10 inches)
- 11 W	
<u>Turbidity:</u> clear, dull clarity (visibility through water 5+ft),	clouded (visibility 2-5ft), highly turbulent (visibility < 2ft)
Odor: no odor, trace (intermittent odor near water sur	rface), moderate (weak odor in breathing zone),
strong (powerful odor throughout sample locati	
Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and Arrest and	•

Time	pH std. units	Temp degree C	Specific Condunctance uohms/cm	Turbidity NTU		ORP (mV)	Q (gpm)	ferrous Iran
10:21	7.84	197.72	1129	2.58	8.13	192.9		0.0 mg/L

A- M Comments:

N 35,90565 W 083.94463

Flow: 997 MPH (ovg. speed)



SMSSSW13 Waterow	Project /Project Number: Date: 97/11 Weather:
Recorded By: \$MINGUIL Photograph #	Site Conditions / Description of adjacent areas: (Include decription of submerged vegetation, bank vegetation/cover, Channelization, etc.)
Approx. Stream Width:	poded area w/ nipples Minnow S
Approx. Stream Depth:	Minnow S
Turbidity of Water:	
Approx. Surface Water Sample Collection Depth:	

#### **KEY**

Organic Substrate: detritus (disintegrated coarse organic material: leaves, twigs, bark), muck/mud (fine, rich, loose organic soil), marl (lime-like material such as shells or limestone)

Inorganic Substrate: clay (plastic, ultra fine), silt (fine, smooth), sand (gritty, course), gravel (diameter 0.1 to 2.5 inches), cobble (diameter 2.5 to 10 inches), boulder (diameter > 10 inches)

Turbidity: clear, dull clarity (visibility through water 5+ft), clouded (visibility 2-5ft), highly turbulent (visibility < 2ft)

Odor: no odor, trace (intermittent odor near water surface), moderate (weak odor in breathing zone), strong (powerful odor throughout sample location)

Time	pH std. units	Temp degree C	Specific Condunctance uohms/cm	Turbidity NTU		ORP (mV)	Q (gpm)	Ferrousim
10:55	78S	1892	1407	2 1.07	8.13	A6.2		0.03 mg/L

Comments:

N 35.90801 W 083.9417 Flow: 1.9 MPH (avg. speed)



Sample Location:	Project /Project Number: Date:
SMSD SW 12 SMS DSW918	Weather:
Recorded By:	3 mm
Knistm English	Site Conditions / Description of adjacent areas: (Include decription of submerged vegetation, bank vegetation/cover, Channelization, etc.)
Approx. Stream Width:	Standing pod Standing pod Small Edopping turble Mosquito Avere
Approx. Stream Depth:	~ SNOW CONTROL
Turbidity of Water:	
Approx. Surface Water Sample Collection Depth:	
2" below surfice	

#### KEY

Organic Substrate: detritus (disintegrated coarse organic material: leaves, twigs, bark), muck/mud (fine,

rich, loose organic soil), marl (lime-like material such as shells or limestone)

Inorganic Substrate: clay (plastic, ultra fine), silt (fine, smooth), sand (gritty, course), gravel (diameter 0.1 to

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Turbidity: clear, dull clarity (visibility through water 5+ft), clouded (visibility 2-5ft), highly turbulent (visibility < 2ft)

Odor:

no odor, trace (intermittent odor near water surface), moderate (weak odor in breathing zone), strong (powerful odor throughout sample location)

Time	pH std. units	Temp degree C	Specific Condunctance uohms/cm	Turbidity NTU	DO (mg/L)	ORP (mV)	Q (gpm)	Ferrons (
13:3	7.11	22.95	6027	445	4,21	41.8		0.68 m

Comments:

N 35 97 21 W 683 92953



Sample Location:	Project /Project Number:	Date: 9/27///			
SMSSW 09	Weather:				
Photograph #	Site Conditions / Description of adjacent areas: (Include decription of submerged vegetation, bank vegetation/cover, Channelization, etc.)				
Approx. Stream Width:					
Approx. Stream Depth:					
Turbidity of Water:					
Approx. Surface Water Sample Collection Depth:					
L					

#### **KEY**

Organic Substrate: detritus (disintegrated coarse organic material: leaves, twigs, bark), muck/mud (fine,

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Turbidity: clear, dull clarity (visibility through water 5+ft), clouded (visibility 2-5ft), highly turbulent (visibility < 2ft)

Odor: no odor, trace (intermittent odor near water surface), moderate (weak odor in breathing zone),

strong (pow	strong (powerful odor thr	strong (powerful odor throughout sai	strong (powerful odor throughout sample location	strong (powerrul odor throughout sample location)	strong (powerrui odor throughout sample location)	strong (powerrui odor throughout sample location)

Time	pH std. units	Temp degree C	Specific Condunctance uohms/cm	Turbidity NTU	DO (mg/L)	ORP (mV)	Q (gpm)
0932	7.67	19.53	2229	3.15	757	らずり	

**Comments:** 



Sample Location:	Project /Project Number:	Date: 9/3 7/1/
SMS SW09 Spring Recorded By:	Weather:	1 7735 7 7 7
	Site Conditions / Description of addecription of submerged vegetation, band Channelization, etc.)	•
Photograph #	onamonzador, oto.)	;
Approx. Stream Width:		
Approx. Stream Depth:		
Turbidity of Water:		
Approx. Surface Water Sample Collection Depth:		

#### **KEY**

Organic Substrate: detritus (disintegrated coarse organic material: leaves, twigs, bark), muck/mud (fine, rich, loose organic soil), marl (lime-like material such as shells or limestone)

**Inorganic Substrate:** clay (plastic, ultra fine), silt (fine, smooth), sand (gritty, course), gravel (diameter 0.1 to 2.5 inches), cobble (diameter 2.5 to 10 inches), boulder (diameter > 10 inches)

**Turbidity:** clear, dull clarity (visibility through water 5+ft), clouded (visibility 2-5ft), highly turbulent (visibility < 2ft)

Odor: no odor, trace (intermittent odor near water surface), moderate (weak odor in breathing zone), strong (powerful odor throughout sample location)

Time	pH std. units	Temp degree C	Specific Condunctance uohms/cm	Turbidity NTU	DO (mg/L)	ORP (mV)	Q (gpm)
0936	7.81	2205	1214	151	7-95	205.0	

**Comments:** 



Sample Location:	Project /Project Number:	Date: 9/27///			
SMSSW04	Weather:	1_1/0_1/11			
Recorded By:					
	Site Conditions / Description of adjacent areas: (Include decription of submerged vegetation, bank vegetation/cover, Channelization, etc.)				
Photograph #					
Approx. Stream Width:					
Approx. Stream Depth:					
Turbidity of Water:					
Approx. Surface Water Sample Collection Depth:					

#### **KEY**

Organic Substrate: detritus (disintegrated coarse organic material: leaves, twigs, bark), muck/mud (fine,

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Turbidity: clear, dull clarity (visibility through water 5+ft), clouded (visibility 2-5ft), highly turbulent (visibility < 2ft)

Odor:

no odor, trace (intermittent odor near water surface), moderate (weak odor in breathing zone), strong (powerful odor throughout sample location)

Time	pH std. units	Temp degree C	Specific Condunctance uohms/cm	Turbidity NTU	DO (mg/L)	ORP (mV)	Q (gpm)
0952	731	19.97	4292	9,26	5.14	234.5	

Comments:



Sample Location:	Project /Project Number:	Date:		
SMSSW08	Weather:			
Recorded By:				
	Site Conditions / Description of adjacent areas: (Inc decription of submerged vegetation, bank vegetation/cover,			
Photograph #	Channelization, etc.)			
Approx. Stream Width:				
Approx. Stream Depth:				
Turbidity of Water:				
Approx. Surface Water Sample Collection Depth:				

## **KEY**

Organic Substrate: detritus (disintegrated coarse organic material: leaves, twigs, bark), muck/mud (fine,

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Turbidity: clear, dull clarity (visibility through water 5+ft), clouded (visibility 2-5ft), highly turbulent (visibility < 2ft)

Odor: no odor, trace (intermittent odor near water surface), moderate (weak odor in breathing zone),

no odor, trace (intermittent odor near water surface), moderate (weak odor in breathing zone), strong (powerful odor throughout sample location)

Time	pH std. units	Temp degree C	Specific Condunctance uohms/cm	Turbidity NTU	DO (mg/L)	ORP (mV)	Q (gpm)
094	0 7.67	20.69	2075	3.25	7.76	P.61C	

**Comments:** 



Sample Location:	Project /Project Number:	Date: / ) 7/11		
SMS SNO8 Sprns Recorded By:	Weather:			
	Site Conditions / Description of addecription of submerged vegetation, bank			
Photograph #	Channelization, etc.)			
Approx. Stream Width:				
Approx. Stream Depth:				
Turbidity of Water:				
Approx. Surface Water Sample Collection Depth:				

#### **KEY**

Organic Substrate: detritus (disintegrated coarse organic material: leaves, twigs, bark), muck/mud (fine,

rich, loose organic soil), marl (lime-like material such as shells or limestone)

Inorganic Substrate: clay (plastic, ultra fine), silt (fine, smooth), sand (gritty, course), gravel (diameter 0.1 to

2.5 inches), cobble (diameter 2.5 to 10 inches), boulder (diameter > 10 inches)

Turbidity: clear, dull clarity (visibility through water 5+ft), clouded (visibility 2-5ft), highly turbulent (visibility < 2ft)

Odor: no odor, trace (intermittent odor near water surface), moderate (weak odor in breathing zone), strong (powerful odor throughout sample location)

pH Temp Condunctance Turbidity
Time std. units degree C uohms/cm NTU DO (mg/L) ORP (mV) Q (gpm)

 Time
 std. units
 degree C
 uohms/cm
 NTU
 DO (mg/L)
 ORP (mV)
 Q (gpm)

 0945
 7.50
 22.25
 35.74
 164
 7.37
 224.7



Sample Location:	Project /Project Number:	Date: / ) -7///
SUSSNOT	Weather:	1 110 7111
Recorded By:		
	Site Conditions / Description of addecription of submerged vegetation, bank	-
Photograph #	Channelization, etc.)	
Approx. Stream Width:		
Approx. Stream Depth:		
Turbidity of Water:		
Approx. Surface Water Sample Collection Depth:		

#### **KEY**

Organic Substrate: detritus (disintegrated coarse organic material: leaves, twigs, bark), muck/mud (fine,

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Turbidity: clear, dull clarity (visibility through water 5+ft), clouded (visibility 2-5ft), highly turbulent (visibility < 2ft)

Odor:

no odor, trace (intermittent odor near water surface), moderate (weak odor in breathing zone), strong (powerful odor throughout sample location)

Time	pH std. units	Temp degree C	Specific Condunctance uohms/cm	Turbidity NTU	DO (mg/L)	ORP (mV)	Q (gpm)
	8.41	9.08	756	15.5	10.04	168.4	



Sample Location:	Project /Project Number:	Date: 9/27///		
SMSSW05	Weather:  Site Conditions / Description of adjacent areas: (Include decription of submerged vegetation, bank vegetation/cover,			
Recorded By:				
Photograph #	Channelization, etc.)			
Approx. Stream Width:				
Approx. Stream Depth:				
Turbidity of Water:				
Approx. Surface Water Sample Collection Depth:				
<u></u>				

#### **KEY**

Organic Substrate: detritus (disintegrated coarse organic material: leaves, twigs, bark), muck/mud (fine, rich, loose organic soil), marl (lime-like material such as shells or limestone)

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Turbidity: clear, dull clarity (visibility through water 5+ft), clouded (visibility 2-5ft), highly turbulent (visibility < 2ft)

Odor: no odor, trace (intermittent odor near water surface), moderate (weak odor in breathing zone), strong (powerful odor throughout sample location)

Time	pH std. units	Temp degree C	Specific Condunctance uohms/cm	Turbidity NTU	DO (mg/L)	ORP (mV)	Q (gpm)
	8.70	10-33	385	12.9	10.25	175.8	



Sample Location:	Project /Project Number:	Date:		
SMSSNOG	Weather:			
Recorded By:		<u></u>		
	Site Conditions / Description of ad decription of submerged vegetation, bank			
Photograph #	Channelization, etc.)			
Approx. Stream Width:				
Approx. Stream Depth:				
Turbidity of Water:				
Approx. Surface Water Sample Collection Depth:				
	<u> </u>			

## **KEY**

Organic Substrate: detritus (disintegrated coarse organic material: leaves, twigs, bark), muck/mud (fine, rich, loose organic soil), marl (lime-like material such as shells or limestone)

Inorganic Substrate: clay (plastic, ultra fine), silt (fine, smooth), sand (gritty, course), gravel (diameter 0.1 to 2.5 inches), cobble (diameter 2.5 to 10 inches), boulder (diameter > 10 inches)

Turbidity: clear, dull clarity (visibility through water 5+ft), clouded (visibility 2-5ft), highly turbulent (visibility < 2ft)

**Odor:** no odor, trace (intermittent odor near water surface), moderate (weak odor in breathing zone), strong (powerful odor throughout sample location)

Time	pH std. units	Temp degree C	Specific Condunctance uohms/cm	Turbidity NTU	DO (mg/L)	ORP (mV)	Q (gpm)
	7.91	9.70	922	36.6	10.13	190.3	



· _	Project /Project Number:	Date:		
——————————————————————————————————————	Weather:			
Recorded By:				
	Site Conditions / Description of add decription of submerged vegetation, bank			
Photograph #	Channelization, etc.)			
Approx. Stream Width:				
Approx. Stream Depth:				
Turbidity of Water:				
Approx. Surface Water Sample Collection Depth:				

#### **KEY**

Organic Substrate: detritus (disintegrated coarse organic material: leaves, twigs, bark), muck/mud (fine,

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Turbidity: clear, dull clarity (visibility through water 5+ft), clouded (visibility 2-5ft), highly turbulent (visibility < 2ft)

<u>Odor:</u> no odor, trace (intermittent odor near water surface), moderate (weak odor in breathing zone),

strong (powerful odor throughout sample location)

Time	pH std. units	Temp degree C	Specific Condunctance uohms/cm	Turbidity NTU	DO (mg/L)	ORP (mV)	Q (gpm)
	8.23	11.	352.0	16.1	9.40	1718	

# SMOKEY MOUNTAIN SMELTERS KNOXVILLE, TENNESSEE

April 2012 RI/FS Sampling Event

Sediment Sampling Log
Book 1 of 1



MANAGING THE VISION® | ENVIRONMENTAL | FACILITIES | LOGISTICS

04/16/2012. Linda Nyland and CJ Roebuck, both of JM Wallet (JMWA) conducting sediment sampling at Smoking win Smelter Site. 0830 Demos from JMWA Aslawta office - travel to Tetra Tech Oak Rogo office for Logbook and SHE Key 1300 on At site, picked up ice for samples and alronking water from Kroger. 1440 Collect sedment sample a SMSSDO3. All hopes pertoning to sample Collecting will be recorded on the pre-printed turns following this page Note: or 4/15/2012 Linda Myland de untammated samphing agnipment (Stainless Steel bowls, Spoons, Scoops and 2 petet proas Rinse Blank @ 1400 on 4/15/2012 for svocs, Restrictes, PCBS, and Metals 1600 LNyland and CJ Roebuck Stuck on down carp over that is s.f. backfull. waiting for AAA. 1730 At SMSSDOY. Dirt work recently has made embankment steep and appear no good path to access CJ. Rochuck Call to descuss of J. Austn. 1800 SMSSBOOS Collected. 1930 Lowes for rope / Machide 2000 Hotel.

84/17/2012
0800 LNyland & CJRobenek ice samples, come at Bottle runs ate for texticity by thereby 1100 on Embayment wil Lee Barron & TREC. The petite ponar is not pricing up fedioneut - it was confirmed by LBarron attempting. L. Barron contacted TREC to bring 5.5. handaugers to Collect Sample - depth 2 SMSSDOOG = 6.0 ft. Return to shore to await augers. Will bag ice.

1300 Lunch. Complete Embayment samp his

1430 Complete Background Sample Pres samples for Shippony

1600 At Leday to ship Toxicaly samples

1645 At SMSSOSWOY to Cut pour & sample lo contrar

1725 Cut path to SMSSDOY. Taking supplies to collect Sample.

1830 Complete Sampling

1900 End Day.

4/18/2012 0830 Prepare Samples for Shippong 0930 Denob to Atlante office

Lyen

PARAGRAM THE VISION I ENVIRONMENTAL   FACILITIES   LOGISTICS	SEDIMENT SAMPENTALES	<u> </u>
SITE NAME: Smokey Mountain Smelters	SITE LOCATION: Knoxville, Tennessee	DATE: 4/16/2012
SAMPLE LOCATION: SMS 51	003	RECORDED BY: Linka Vyland
WEATHER CONDITIONS: MOSKY C	and Breezy 855	

**SEDIMENT DATA** Collection Method: >tantess steel scrap Sample ID: SMS SNO3 Duplicate: Yes/ No w/ bowl / spoon (s.s.) Sample Time: 1440 Duplicate ID: Collection Depth Interval: 0.3:N Sampled By: Lhyland / CJ Rochack MS/MSD: Yes/10

Sample Analysis	Number of Containers	Container Type	Sample Volume	Preservative
TCL SVOCS , PEST PCRS	y2	. 8 oz. glass	Fill to Capacity	Cool to 4° C
TAL Metals	1	8 oz. glass	Fill to Capacity	Cool to 4° C
ICL Posticides (wwn 5.2-l	1	8 oz. glass	Fill to Capacity	Cool to 4° C
Aroclore/PCBs Toxicity	1/2	1/2 (to 8 oz glass	Fill to Capacity	Cool to 4° C

SEDIMENT OBSERVATIONS

Sediment Description: (Color, Sand, Silt, Clay, etc.) Reddish orange clay w/ some small gravel and some s: H

Photo Number/Description: (Include direction)
# DSCN 0436, East Northeast Wirecton Facing up stream to SMSSDO3W/ JAWally

photo tru: 1443 1443

Photosapher: Linda by land (Thiwaller)

CJ Roebuck Collecting

Photographer: Linda by land (Thiwaller)

CPS 10 caten

J.M.WALI ASSOCIATE	
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MANAGING THE VISION*   ENVIRONMENTAL   FACILITIES   LOGISTICS	OFDIMENT SAME FING FO	<del>,                                    </del>
SITE NAME: Smokey Mountain Smelters	SITE LOCATION: Knoxville, Tennessee	DATE: 4/14/2012
SAMPLE LOCATION: 5MS	8602	RECORDED BY: Lande Unlawel
WEATHER CONDITIONS: MOSHLE	Londy / 80.5/ Breezy	
	SEDIMENT DATA	
Sample ID: SMSSDO 8	Duplicate: Yes/Mo	Collection Method: 5.5. SCOOP -0/

	OEDIMENT DATA	
Sample ID: SMSSIW8	Duplicate: Yes/Mo	Collection Method: 5.5. S(00) w/
Sample Time: [ [ [ V O		S. S. Ww//Spour
Sampled By: L Nyland / C Rubur	MS/MSD: Yes/NO	0-31N

SAMPLE CONTAINER SPECIFICATION

Sample Analysis	Number of Containers	Container Type	Sample Volume	Preservative
TCL SVOCS / PUBS / PEST	/2	8 oz. glass	Fill to Capacity	Cool to 4° C
TAL Metals	1	8 oz. glass	Fill to Capacity	Cool to 4° C
TCL Pasticides (wain Size	1	8 oz. glass	Fill to Capacity	Cool to 4° C
Araclars/PCBs Toxicity	1/2	1/2 Gabbonglass Duly	Fill to Capacity	Cool to 4° C

### **SEDIMENT OBSERVATIONS**

Silty clay, some grand, 5 one Fre Sand

Photo Number / Description: (Include direction)

Photo # DSCNOY37, facing Northeast. Culvert, upstream
from Sample location SMSSDOR.

Photo Time = 1005. 1805 en

Photographer: Linda Hyland (Januarles) CJ Roebuck (JMWaller).

Photographer: Location SE, culvert near Sample location SMSSDOB

Photo trini: 1806

Photographer: CJ Roback (JMWaller)

J.M.WALLER' ASSOCIATES, INC.
MANAGING THE VISIONS ENVIRONMENTAL I

**SEDIMENT SAMPLING LOG** DATE: 4/17/2012 SITE LOCATION: Knoxville, Tennessee SITE NAME: Smokey Mountain Smelters SMSSD05 RECORDED BY: L. Nylane SAMPLE LOCATION: WEATHER CONDITIONS: Overcast / 70's Collection Method: Patte Ponat, Auges **SEDIMENT DATA** Duplicate: Yes/ Nู่b) Sample ID: 5MSSD05 S.S. how/ / spoon Sample Time: [140 Duplicate ID:_ Collection Depth Interval:

SAMPLE CONTAINER SPECIFICATION

Number of Containers	Container Type	Sample Volume	Preservative
1 2	8 oz. glass	Fill to Capacity	Cool to 4° C
1	8 oz. glass	Fill to Capacity	Cool to 4° C
1	8 oz. glass	Fill to Capacity	Cool to 4° C
12	8 oz. glass	Fill to Capacity	Cool to 4° C
	Number of Containers	y         Z         8 oz. glass           1         8 oz. glass           1         8 oz. glass	8 oz. glass Fill to Capacity 1 8 oz. glass Fill to Capacity 1 8 oz. glass Fill to Capacity 1 8 oz. glass Fill to Capacity

1/2 Gallon Ally

0-6:N

SEDIMENT OBSERVATIONS

Sediment Description: (Color, Sand, Silt, Clay, etc.) Grey chang mitted ut some organic matter. Depth u 5.0ft

Sampled By: LNyland /CT Rodned (MS/MSD: Yes/NO

Photo Number / Description: (Include direction)

No phiso

TCL SVOCs / C S / S / S / T / Z 8 oz. glass Fill to Capacity Cool TAL Metals 1 8 oz. glass Fill to Capacity Cool TOL-Pesticides Grown 1 8 oz. glass Fill to Capacity Cool	AGING THE VISION* ENVIRONMENTAL   FACILITIES   LOGISTICS	SEDIMENT SAMP	<u> </u>	<del>-</del>	<del>      //-   -   -   -   -   -   -   -   </del>	
Sample ID: SMS SD 8 Sample Time:   23D   Duplicate: Yes/ND   Duplicate: Yes/ND   Duplicate: Yes/ND   Sample Time:   23D   Duplicate: Yes/ND   Duplicate: Yes/ND   Collection Method: 5.5. au ser/Sprows   Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collection Depth Interval: Collecti	SITE NAME: Smokey Mountain Smelters	SITE LOCATION: Knoxville, Tennes	see	DATE:	7114/2	1010
Sample ID: SMS SD18 Sample Time: 1230  Duplicate: Yes/No  Duplicate: Yes/No  Duplicate: Yes/No  Duplicate: Yes/No  Duplicate: Yes/No  Sample Time: 1230  Sample By: Lityland CTRodnak MS/MSD: Yes/No  Sample CONTAINER SPECIFICATION  Sample Analysis  Number of Containers  Container Type  Sample Volume  Prese  TCL SVOCs FC 135 FV 51  A oz. glass  Fill to Capacity  Cool  TAL Metals  1 8 oz. glass  Fill to Capacity  Cool  TGL-Pesticides Grow  1 8 oz. glass  Fill to Capacity  Cool  TGL-Pesticides Grow  1 8 oz. glass  Fill to Capacity  Cool  TGL-Pesticides Grow  1 8 oz. glass  Fill to Capacity  Cool  Sediment Description: (Color, Sand, Silt, Clay, etc.)		<u> 5018</u>		RECORDE	DBY: Linda	Malan
Sample ID: SMS SD 9 Sample Time:   230  Duplicate: Yes/ No  Sample Time:   230  Sample Duplicate: Yes/ No  Duplicate: Yes/ No  Sample Time:   230  Sample Duplicate: Yes/ No  Duplicate: Yes/ No  Sample Time:   230  Sample Duplicate: Yes/ No  Sample Time:   230  Sample Duplicate: Yes/ No  Sample Time:   230  Sample Duplicate: Yes/ No  Sample Time:   230  Sample Duplicate: Yes/ No  Sample Time:   230  Sample Duplicate: Yes/ No  Sample Time:   230  Sample Duplicate: Yes/ No  Sample Time:   230  Sample Time:   230  Sample Duplicate: Yes/ No  Sample Time:   230  Sam	VEATHER CONDITIONS: ONU COL	54/ 705'			<u>_</u>	/
Sample ID: SMS SD 9 Sample Time:   230  Duplicate: Yes/ No  Sample Time:   230  Sample Duplicate: Yes/ No  Duplicate: Yes/ No  Sample Time:   230  Sample Duplicate: Yes/ No  Duplicate: Yes/ No  Sample Time:   230  Sample Duplicate: Yes/ No  Sample Time:   230  Sample Duplicate: Yes/ No  Sample Time:   230  Sample Duplicate: Yes/ No  Sample Time:   230  Sample Duplicate: Yes/ No  Sample Time:   230  Sample Duplicate: Yes/ No  Sample Time:   230  Sample Duplicate: Yes/ No  Sample Time:   230  Sample Time:   230  Sample Duplicate: Yes/ No  Sample Time:   230  Sam		· /				
Sample Time:   230  Duplicate   D:	Sample ID:		<u> </u>	Collection M	fethod:	
Sample Time: 1230  Sample Time: 1230  Sample Ms/Msd: Yes/No  Sample Analysis  Number of Containers  Container Type  Sample Volume  Prese  TCL SVOCs / C / S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S / Y S	2W52018	Depiloate. For the		۳.	5.5.00	ng / pon
Sampled By: Light of CTRocked MS/MSD: Yes/No  Sample Analysis  Number of Containers  Container Type Sample Volume Prese  FCL SVOCs / C / S / V S f	Sample Time: 1230	Duplicate ID:		•	<del>-</del>	•
SAMPLE CONTAINER SPECIFICATION  Sample Analysis  Number of Containers  CL SVOCs  CL SVOCs  AL Metals  1 8 oz. glass  Fill to Capacity  Cool  Col-Pesticides (grown  1 8 oz. glass  Fill to Capacity  Cool  C				Collection D		<b>A</b> 21.3
Sample Analysis  Number of Containers  Container Type  Sample Volume  Prese  CL SVOCs  CL SVOCs  CL SVOCs  CL SVOCs  Prese  CL SVOCs  CL SVOCs  Prese  Sample Volume  Prese  Cool  Soc. glass  Fill to Capacity  Cool  Soc. glass  Fill to Capacity  Cool  C	sampled By: LHYaud / CTRochall	MS/MSD: Yes/N/			0-6-N	0-312
Sample Analysis  Number of Containers  Container Type  Sample Volume  Prese  CL SVOCs / C 35 / V 5f  / Z 8 oz. glass  Fill to Capacity  Cool  GL Pesticides Grown  1 8 oz. glass  Fill to Capacity  Cool  Voctors/PCBs  Toxicity  1 2 8.oz. glass  Fill to Capacity  Cool  Voctors/PCBs  Toxicity  SEDIMENT OBSERVATIONS  Sediment Description: (Color, Sand, Silt, Clay, etc.)	1	CAMPLE CONTAINED C		B.I		
TCL SVOCs / C/Ds / V St / 2 8 oz. glass Fill to Capacity Cool TAL Metals 1 8 oz. glass Fill to Capacity Cool TGL-Pesticides Grown 1 8 oz. glass Fill to Capacity Cool Afoctors/PCBs TUX CTH 1 2 8 oz. glass Fill to Capacity Cool Y Cool Y C/D CAPACITY COOL SEDIMENT OBSERVATIONS Sediment Description: (Color, Sand, Silt, Clay, etc.)	Sample Analysis	1			Sample Volume	Preservative
TAL Metals  1 8 oz. glass Fill to Capacity Cool FGL Pesticides Grown  1 8 oz. glass Fill to Capacity Cool Riociors/PCBs TUX/City  1/2 8.oz. glass Fill to Capacity Cool War '2 God Puly SEDIMENT OBSERVATIONS Sediment Description: (Color, Sand, Silt, Clay, etc.)		1/2				Cool to 4° C
1 8 oz. glass Fill to Capacity Cool Toclors/PCBs Toxicity 1/2 8.oz.glass Fill to Capacity Cool Your 1/2 6.oz.glass Fill to Capacity Cool	<del> </del>	1	<u> </u>			Cool to 4° C
Aroctors/PCBs Tukicity  1/2 8.ez-glass Fill to Capacity Cool 2/2 (Cool Puly SEDIMENT OBSERVATIONS Sediment Description: (Color, Sand, Silt, Clay, etc.)		- <del></del>	<del>-</del>			Cool to 4° C
SEDIMENT OBSERVATIONS Sediment Description: (Color, Sand, Silt, Clay, etc.)		1/2	<u> </u>			Cool to 4° C
SEDIMENT OBSERVATIONS  Sediment Description: (Color, Sand, Silt, Clay, etc.)		7 -	1200	I Ally	<u> </u>	
Sediment Description: (Color, Sand, Silt, Clay, etc.)		A		/		
	Coding at Department (Color Cond Cill Clay at		VATIONS		<u> </u>	
Depth = 3.5ft						
Depth = 3.5ft	Gray day, Some ors	ane patter	على المراجعين المراجعين المراجعين المراجعين المراجعين المراجعين المراجعين المراجعين المراجعين المراجعين المراجع المراجعين المراجعين	برواريها وجهيد سند كايان جهاد داده جسن	and any or the desirent on the con-	
136pth 4 5.5th	N. J. 3 r.C+				,	
	34th 4 5.5H					
		ı				
		įλ				
Jan L			The second residence of the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second se			

Photo Number / Description: (Include direction)

No phAo



Tresponding   Property		
SITE NAME: Smokey Mountain Smelters	SITE LOCATION: Knoxville, Tennessee	DATE: 4/17/2012
SAMPLE LOCATION:	Demil	RECORDED BY: L. Pyland
WEATHER CONDITIONS:	+1 70.5	

SEDIMENT DATA				
Sample ID: SMSS011	Duplicate: Yes/No	Collection Method: Staniess Stee		
Sample Time: ) 4/5	Duplicate ID:	Collection Depth Interval:		
Sampled By: LNyland/ Chocker	MS/MSD: Meg/ No	0-311		

SAMPLE CONTAINER SPECIFICATION

Sample Analysis	Number of Containers	Container Type	Sample Volume	Preservative
TCL SVOCS / PCB5 / lust	1/2	8 oz. glass	Fill to Capacity	Cool to 4° C
TAL Metals	1	8 oz. glass	Fill to Capacity	Cool to 4° C
TGL-Posticides (way	1	8 oz. glass	Fill to Capacity	Cool to 4° C
Aroclors/PCBs T. X.C. ty	1/2	8 oz. glass	Fill to Capacity	Cool to 4° C

12601. HDPE

SEDIMENT OBSERVATIONS

ctay S: Hy Sand of Some growl, some Clay.

Photo Number/Description: (Include direction)
Photo Number/Description: (Include direction)
Photo No SCHO 439, facing South. CI Proclouck (IMWaller) ninser sampling
agrupoment offer collector of SMSSDII. Facing downstream to SMSSDII
Post sample Collector. Time: 1454, photographer: Linela Michael (IMWaller)

Photo 4 DSCHO440, facing SE, CJ Rochneck near sample location BUSSDII.
Time: 1455. Photographe: Linda Hyland (Thiwaller)

SITE NAME: Smokey Mountain Smelters	SITE LOCATION: Knoxville, Tennessee	DATE: 4/17/2012
SAMPLE LOCATION:	ssismoy	RECORDED BY: Linda Hyland
WEATHER CONDITIONS:	scast 80.8	

Duplicate: Yes No

Sample ID MSSOO4

Sediment Description: (Color, Sand, Silt, Clay, etc.)

Duplicate ID: SMS SO 904 1815

Collection Method: S.S Scoop noods) know

Collection Depth Interval:

**5**′3

MS/MSD: Yes/ No

SAMPLE CONTAINER SPECIFICATION

Sample Analysis	Number of Containers	Container Type	Sample Volume	Preservative	
TCL SVOCS , PCBS /Prst	12	8 oz. glass	Fill to Capacity	Cool to 4° C	
TAL Metals	1	8 oz. glass	Fill to Capacity	Cool to 4° C	
TGL Pesticides (acc: V	1	8 oz. glass	Fill to Capacity	Cool to 4° C	
Aroclors/PCBs Toricula	12	-8 oz. glass	Fill to Capacity	Cool to 4° C	

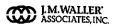
"12 Gal HOPE

## SEDIMENT OBSERVATIONS

Some sity clay w/ well staded sand.

Note: upstream - 300ff an over 3 clearing w/ dirt workhas occurred. This location shows exosion into creek-although
as s: It fenewas evident in brush new stream.

Photot DSCH0444, facing East, Holhert, South Southeast, Sample location SMSSDOY, after Sample was confeded. Time: 1837. Photographe: L. Nyland photo ! DSCN 0945, foring NE at 5MSSDOY (after sample collector) w/ rug and cultert in background. Time: 1837. Photographs: Lilylons Note: Tondos DSCNO441 to DSCNO443 - Not pertnewt to sample collected -but of path cleared through brush to access this boy.



MANAGERA (ARE ALS DIV.), ENVIRONMENTAL   FACILITIES   FOGISTICS	OEDMINI TO THE	<del></del>
SITE NAME: Smokey Mountain Smelters	SITE LOCATION: Knoxville, Tennessee	DATE:
SAMPLE LOCATION:		RECORDED BY:
WEATHER CONDITIONS:		
	SEDIMENT DATA	
Sample ID:	Duplicate: Yes/ No	Collection Method:
_	Duntlanta ID	
Sample Time:	Duplicate ID:	Collection Depth Interval:
Sampled By:	MS/MSD: Yes/ No	
Ostripios 2).		

SAMPLE CONTAINER SPECIFICATION

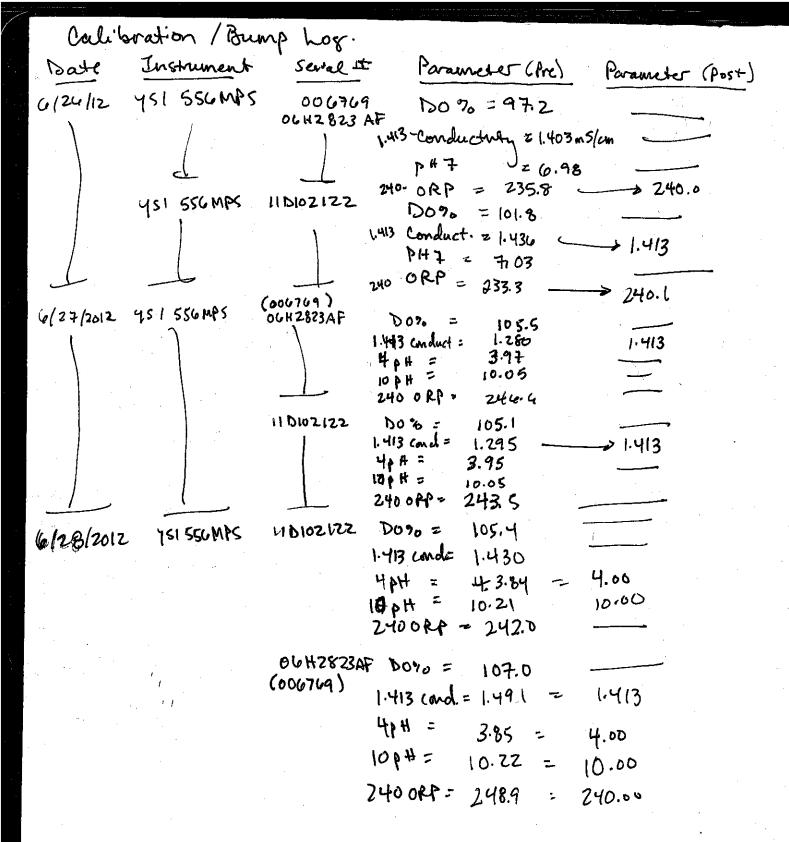
Sample Analysis	Number of Containers	Container Type	Sample Volume	Preservative
TCL SVOCs	1	8 oz glass	Fill to Capacity	Cool to 4° C
TAL Metals	1	8 z. glass	Fill to Capacity	Cool to 4° C
TCL Pesticides	1	8 oz. glass	Fill to Capacity	Cool to 4° C
Aroclors/PCBs	1	8 oz. glass	Fill to Capacity	Cool to 4° C

Sediment Description: (Color, Sand, Silt, Clay, etc.)

Photo Number / Description: (Include direction)



SAMPLE LOCATION: WEATHER CONDITIONS:  Sample ID: Duplicate: Sample Time: Duplicate II Sampled By:  SAI	):	SPECIFICATIO  Container  8 oz. gla 8 oz. gla 8 oz. gla 8 oz. gla	Type S	nod:	Preservative  Cool to 4° C  Cool to 4° C  Cool to 4° C  Cool to 4° C
Sample ID:  Sample Time:  Duplicate II  Sampled By:  Sample Analysis  TCL SVOCs  TAL Metals  TCL Pesticides  Aroclors/PCBs  Sediment Description: (Color, Sand, Silt, Clay, etc.)	Yes/ No D:	SPECIFICATIO  Confainer  8 oz. gla  8 oz. gla  8 oz. gla  8 oz. gla	Collection Met  Collection Dep  N  Type S  ss ss	imple Volume Fill to Capacity Fill to Capacity Fill to Capacity	Cool to 4° C Cool to 4° C Cool to 4° C
Sample ID:  Sample Time:  Duplicate:  Sampled By:  Sample Analysis  TCL SVOCs  TAL Metals  TCL Pesticides  Aroclors/PCBs  Sediment Description: (Color, Sand, Silt, Clay, etc.)	Yes/ No D:	SPECIFICATIO  Confainer  8 oz. gla  8 oz. gla  8 oz. gla  8 oz. gla	Collection Dep	iample Volume Fill to Capacity Fill to Capacity Fill to Capacity	Cool to 4° C Cool to 4° C Cool to 4° C
Sample Time:  Sample By:  SAN  Sample Analysis  TCL SVOCs  TAL Metals  TCL Pesticides  Aroclors/PCBs  Sediment Description: (Color, Sand, Silt, Clay, etc.)	Yes/ No D:	SPECIFICATIO  Confainer  8 oz. gla  8 oz. gla  8 oz. gla  8 oz. gla	Collection Dep	iample Volume Fill to Capacity Fill to Capacity Fill to Capacity	Cool to 4° C Cool to 4° C Cool to 4° C
Sample Time:  Sample Analysis  TCL SVOCs TAL Metals TCL Pesticides Aroclors/PCBs  Sediment Description: (Color, Sand, Silt, Clay, etc.)	Yes/ No D:	SPECIFICATIO  Confainer  8 oz. gla  8 oz. gla  8 oz. gla  8 oz. gla	Collection Dep	iample Volume Fill to Capacity Fill to Capacity Fill to Capacity	Cool to 4° C Cool to 4° C Cool to 4° C
Sample Time:  Sample Analysis  TCL SVOCs TAL Metals TCL Pesticides Aroclors/PCBs  Sediment Description: (Color, Sand, Silt, Clay, etc.)	PLE CONTAINER Number of Containers  1 1 1 1	Confainer  8 oz. gla: 8 oz. gla: 8 oz. gla: 8 oz. gla:	Collection Dep	iample Volume Fill to Capacity Fill to Capacity Fill to Capacity	Cool to 4° C Cool to 4° C Cool to 4° C
Sample Analysis  TCL SVOCs TAL Metals TCL Pesticides Aroclors/PCBs  Sediment Description: (Color, Sand, Silt, Clay, etc.)	#PLE CONTAINER Number of Containers  1 1 1 1	Confainer  8 oz. gla: 8 oz. gla: 8 oz. gla: 8 oz. gla:	DN Type S SS SS SS	Fill to Capacity Fill to Capacity Fill to Capacity	Cool to 4° C Cool to 4° C Cool to 4° C
Sample Analysis  TCL SVOCs TAL Metals TCL Pesticides Aroclors/PCBs  Sediment Description: (Color, Sand, Silt, Clay, etc.)	IPLE CONTAINER Number of Containers  1 1 1 1	Confainer  8 oz. gla: 8 oz. gla: 8 oz. gla: 8 oz. gla:	DN Type S SS SS SS	Fill to Capacity Fill to Capacity Fill to Capacity	Cool to 4° C Cool to 4° C Cool to 4° C
Sample Analysis  TCL SVOCs  TAL Metals  TCL Pesticides  Aroclors/PCBs  Sediment Description: (Color, Sand, Silt, Clay, etc.)	IPLE CONTAINER Number of Containers  1 1 1 1	Confainer  8 oz. gla: 8 oz. gla: 8 oz. gla: 8 oz. gla:	Type S	Fill to Capacity Fill to Capacity Fill to Capacity	Cool to 4° C Cool to 4° C Cool to 4° C
Sample Analysis  TCL SVOCs  TAL Metals  TCL Pesticides  Aroclors/PCBs  Sediment Description: (Color, Sand, Silt, Clay, etc.)	Number of Containers  1 1 1 1	Confainer  8 oz. gla: 8 oz. gla: 8 oz. gla: 8 oz. gla:	Type S	Fill to Capacity Fill to Capacity Fill to Capacity	Cool to 4° C Cool to 4° C Cool to 4° C
Sample Analysis  TCL SVOCs  TAL Metals  TCL Pesticides  Aroclors/PCBs  Sediment Description: (Color, Sand, Silt, Clay, etc.)	Number of Containers  1 1 1 1	Confainer  8 oz. gla: 8 oz. gla: 8 oz. gla: 8 oz. gla:	Type S	Fill to Capacity Fill to Capacity Fill to Capacity	Cool to 4° C Cool to 4° C Cool to 4° C
TCL SVOCs TAL Metals TCL Pesticides Aroclors/PCBs  Sediment Description: (Color, Sand, Silt, Clay, etc.)	1 1 1 1	8 oz. gla: 8 oz. gla: 8 oz. gla: 8 oz. gla:	ss ss	Fill to Capacity Fill to Capacity Fill to Capacity	Cool to 4° C
TAL Metals TCL Pesticides Aroclors/PCBs  Sediment Description: (Color, Sand, Silt, Clay, etc.)	1 1 1	8 oz. gla: 8 oz. gla: 8 oz. gla:	ss ss	Fill to Capacity Fill to Capacity	Cool to 4° C
Aroclors/PCBs  Sediment Description: (Color, Sand, Silt, Clay, etc.)	1	8 oz. gla:	ss	Fill to Capacity	Cool to 4° C
Sediment Description: (Color, Sand, Silt, Clay, etc.)		8 oz. gla		Fill to Capacity	Cool to 4° C
2 M	SEDIMENT OBSE	RVATIONS			
Photo Number / Description: (Include direction)					
<del></del>					



AS:	<b>A.WALLER'</b> SOCIATES, INC.			CD	OT INIDAM	ATED CA	MDI ING	100			
	ION*  ENVIRONMENTAL   F			GR		ATER SA	· · · · — - · ·	LOG	<del></del>	DATE: /A	126/12
	: Smokey Mou		ers_		SITE LOCATI	ON: Knoxville		1			
WELL NO: WEATHER	CONDITIONS/	GENERAL	OBSÉR	RVATIONS:	SAMPLE ID:		nwlo.		<del>.</del> .	SAMPLE TIM	0820
**					leas/		zreezy	<u> </u>			0620
Well Type	<del></del>		P	timp (and S/N)	: 5.5. Me	PURGING E	/6017			Total Well De	pth (feet): 32
Well Type:								2022 4	<u>-</u>	1	T
Well Diamete	er (inches): 2	.0		*		481 554		2823 A	<b>-</b>	Screen Interv	al (feet) スター3ス
	neter (inches): 3	•	İ		•	ech 2100G		7			o Water (feet) 25.5
	rial: PTF1					):Solinst		767			u <b>2</b> 9.0
					•	X Well Capacit	1				Purged (gallons): 2:93
= (37	feet _	25.9	eet) >	× 0-14 9	allons/foot	= 8.97	gallons	x3 72.	93)	Total Volume	Purged (gallons): 3. 50
Time	Volume Purged (gal	Total Volume Purged (gal)		Depth to Water (feet)	Temp. ( ^O C)	Specific Conductance ms/cm or pS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
0908	0.50	0.50	2	4.49	[8.03	6.404	5.94	3.70	408.4	117	Gray
0914	0.75	1.25	7	27.40	18.24	4. 555	5.10	3.70	397.5		Clearing
0930	[. 00	2.25		27.40	20.03	6.975	4.80_	3.86	384.1	42.7	
Note:	~ 0940	turn	e ol	off pur	ng to al	low reche	re-re	samed		o with	purge 5
1102	1.25	3.50			<u>'17.70</u>	6-83	5.12	3.70	381.6		Condy
* off	,				_	to san					47 0-
6/27/	2012		<u>.45</u>			<del></del>		educt s		۔ ا	quality reading
0850	Start Sau	yee	<u> </u>	Ken 5	17.55	7.144	5.49	4.04	310. 7	66.3	<del>                                     </del>
				· · -			3.44				
										<u> </u>	
										,	
	ty (Gal/Ft):      C le Diameter Ca ı Criteria Rango		/Ft):	<b>1/8"</b> ≈ 0.0006			).0026; <b>5/1</b>	= 0.37; 4" 6" ≈ 0.004; ed Oxygen: ±	3/8" = 0.006		= 1.47; <b>12</b> " = 5.88 10; <b>5/8</b> " = 0.016 t; <b>Turbidity</b> : <10 NTU
	<u> </u>				s	AMPLING SU	MMARY			<u> </u>	
Field Filtered Filter Size:	l: Yes / No		ate: Ye cate ID				Tim	ne:		MS/N	MSD: Yes/
Sampl	le Analysis		ber of iners	Type Contai		/inimum Samp Volume	le	Preser	vation		Holding Time
тс	L VOCs ,	1 1	3	40 mL	vials	Fill to Capacity		Cool to 4° C;	HCl to pH <2		14 days
TAL M	/letals + Hg		1	1 L H	PE	1 L	Co	ool to 4 ± 2° C;	HNO ₃ to pH	<2	180 days
TAL Metals	s + Hg (filtered)	·	1	1 L HC	PE	1 L	Co	ol to 4 ± 2° C;	HNO3 to pH	<2	180 days
ammonia, d	itrite, alkalinity, chloride, sulfate iate, fluoride	,   т	BD	Poly	rs .	TBD		Bottles provi	ded by PEL		
C	yanide		1	1L HD	PE	1 L	Co	ool to 4 ± 2° C,	NaOH to pH	-12	28 days
<u> </u>	CBs) SVO	CS (	,	ILAN	Mee/	SCREENING		10 40 4°C	: 20		
Sampl	le Analysis			Method		Date/ Time		Res			Notes
Feri	rous Iron	_		Hach 8146		4127/201	2 0835	2.9	8 ring 1	tunto	a white
		_					· · · · · · · · · · · · · · · · · · ·				
						L_1					
SAMPLER(S	S) SIGNATURE	: (	l-	2-7	6	1/1	111				



MANAGING THE VISI	ON- ENVIRONMENTAL	ACIEITIES   LOGISTICA		Τ	VATER SA					2110	$\neg$
SITE NAME	: Smokey Mou	ntain Smelte	rs	SITE LOCA	TION: Knoxvill	<del></del>			DATE: (p /	24/12	_
WELL NO:	WMIO		POEDVÁTIONO.	SAMPLE I	SMS	mmloi	<u> </u>		SAMPLE TIME	1225	_
WEATHER		GENERAL O	BSERVATIONS:	Clear	170.51	Breez	4				
			T		PURGING		<u> </u>	<del> </del>	· <del></del>		<del></del>
Well Type:	Flush		Pump (and S/	N): 85 W	ensoen t	4 0167	75		Total Well Dep	th (feet): 70	
Well Diamete	er (inches): 2	.'12	Water Quality	Meter (and S/N	1): YSI 559	> liblo	2122		Screen Interva	(feet) 60-70	
	eter (inches): 3				Hach 210			535	Static Depth to	Water (feet) 25.8	
Tubing Mate	rial: PTF	5 TFF	Water Level Ir	ndicator (and S	N): Solins	+ HOI	6953		Tubing Depth	4300	
1 WELL VO	LUME PURGE	= (Total We			r) X Well Capaci			<del></del>	Volume to be F	Purged (gallons): 21.	21
= ( <b>70</b>	feet -	ኡ <b>ડ</b> · የ	et) × O·lÇ	gallons/foot	≈ 7.0 T	gallons —	¥3= 2	1.21	Total Volume F	Purged (gallons): 2(.	25
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Conductance cos/cpi or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation	
2880	ტ.56	0.50	26.40	18.85	1.738	(. 6, 8	6.86	727.7	12.4	Cleas	
941	[,00	1.50	26.84	18.58	1.718	0.57	6.60	100.2	16.8	Clear	_#
<u> </u>	3.00	11.50	26.56	17.54	1.643	0.46	6.49	109.6	11.2	Clear	_]]
1021	3.75	8.25	<u> </u>	18. 28	1.683	0.36	4.44	70.5	40.2	Clear	-
1036	2.25	10.50	26.78	18.68	1.768	0.37	6.41	61.3	11.2	Clear	-
1101	2.50	13.00	24.55	19.70		0.30	6.35	40.4	7.00	Clear	$\dashv$
1113	1.00	15.00	26.55	19.55	1.869	0.58	6.33	35.3	12.3	Che	$\dashv$
117	1.00	16.25		19.77	1.908	0.27	1	33.7 29.9	4.45	alex	刊
1130	1.25	18.00	26.59	19.62	1.927	0.25	6.31	29.8	3.47	aleen	-
1207	2,00	20.00	26.61	19.88	1.954	0.25	6.30	25.0	1.85	Close	╢
1219	1.25	21.25		19.97	1.978	0.25	6.27	21.4	241	Clin	╢
1611	1.63	C1. 23	24.41	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	1.118	0.62	Q- 2-1	21.4	<u>a2* -( ( </u>		┨
Tubing Insid	ty (Gal/Ft): (de Diameter Ca Criteria Rang	pacity (Gal/F	t): 1/8" = 0.000	06; <b>3/16"</b> = 0	1.25" = 0.06; 2 0.0014; 1/4" = 0 onductance: ± 59	0.0026; <b>5/</b> 1	' = 0.37; 4'   6" = 0.004;   ed Oxygen: <u>+</u>	3/8" = 0.000	6; <b>1/2"</b> = 0.01	: 1.47; <b>12"</b> = 5.88 D; <b>5/8"</b> = 0.016 <b>Turbidity:</b> <10 NT	U
					SAMPLING SU	JMMARY		. <u> </u>			
Field Filtered Filter Size:	: Yes/(No)	Duplicate Duplica	: Yes/No			Tim	20:		MS/MS	SD: Yes No	$\neg$
	le Analysis	/ Number	er of Typ	e of ainer	Minimum Samp Volume			rvation		Holding Time	7
TC	L VOCs	1 3	40 ml	_ vials	Fill to Capacity		Cool to 4° C;	HCI to pH <2		14 days	$\neg$
TAL	/letals + Hg	1	1 L F	IDPE	1 L	Co	ool to 4 ± 2° C;	HNO₃ to pH	<2	180 days	ユ
TAL-Metale	+ Hg (filtered)	1	+ <del>+</del> + <del></del>	IDPE			<del>ol to 4 ± 2° C</del> ;	FINOS to pH	<2	180 days	7
ammonia,	itrite, alkalinity, chloride, sulfate rate, fluoride	ТВС	Po	lys	TBD		Bottles prov	ided by PEL			
c	yanide	1		IDPE	1 L	Co	ool to 4 ± 2° C,	NaOH to pH	<b>-12</b>	28 days	
PCB	/Pest/S	vocs i	2 ILAM	bus FIEL	.D SCREENING	3 SUMMARY	•				
Samp	le Analysis	·   -	Method		T	of Analysis		ults		Notes	コ
Fer	rous Iron		Hach 814	6	4/23/12	1230	0.02	molL			$ \bot $
			· <del></del>		ļ		ļ	<u> </u>	·		$\bot$
					1		1		]		
				<del></del>			L		<u> </u>		

GROUNDWATER SAMPLING LOG MANAGING THE VISION* | ENVIRONMENTAL | FACILITIES | LOGISTICS 6/24/2012 SITE LOCATION: Knoxville, Tennessee SITE NAME: Smokey Mountain Smelters MW 02A SMSMW02A SAMPLE TIME: WEATHER CONDITIONS/ GENERAL OBSERVATIONS: Security **PURGING DATA** Pump (and S/N): \$5 Monsoon # 016775 Well Type: Lush Total Well Depth (feet): Water Quality Meter (and S/N): YSI IID 102 122 Screen Interval (feet) 67-27 Well Diameter (inches): 2." Tubing Diameter (inches):3 | L x 14 Turbidity Meter (and S/N): Hach 1108000 11535 Static Depth to Water (feet) 14.96 Tubing Material: TFE Water Level Indicator (and S/N): Solinst # 016953 Tubing Depth ~ 20 F4 1 WELL VOLUME PURGE = (Total Well Depth - Static Depth to Water) X Well Capacity Volume to be Purged (gallons): 577 feet - 14.94 feet) X 0.16 gallons/foot = {.92 gallons ¥3 Total Volume Purged (gallons): = 5.77 Total Conductance ms/om or Volume Depth to Dissolved pН ORP Volume Temp. **Turbidity** Odor/ Color Oxygen (mg/L) Water Time Purged (standard Purged (°C) (mV) (NTUs) Observation (gal (feet) units) (gal) μS/cm DORGON 672 4.34 0.29 ク・マミ 14.99 26.06 10.43 1.29 9.75 47.8 cimile 14.99 3.00 1834 10.13 25 0.32 9.74 59.7 9.80 10.16 0.30 10.20 0.30 9.79 1500 30.5 **23.4** 14.00 arameters. to ce 6.53 Well Capacity (Gal/Ft): CMT = 0.0106, 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.1 Tubing Inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 2" = 0.16; **3"** = 0.37; 4" = 0.65;**5"** = 1.02; 6" = 1.47;**12"** = 5.88  $5/16" \approx 0.004;$  3/8" = 0.006;1/2" = 0.010; 5/8" = 0.016 Stabilization Criterla Range: Specific Conductance: ± 5%; Temperature: ± 0.2 °C; Dissolved Oxygen: ± 0.2 mg/L, **pH:**  $\pm$  0.1 unit; Turbidity: <10 NTU SAMPLING SUMMARY Field Filtered: Yes/ No Duplicate: Yes/ No Filter Size: Duplicate ID: MS/MSD: Yes/ Time: Number of Type of Minimum Sample Sample Analysis Preservation **Holding Time** Containers Container Volume TCL VOCs 40 mL vials Fill to Capacity Cool to 4° C; HCI to pH <2 14 days TAL Metals + Ho 1 1 L HDPE 1 L Cool to  $4 \pm 2^{\circ}$  C; HNO₃ to pH <2 180 days TAL Metals + Hg (filtered)* ' 1 L HDPE 1 L Cool to 4 ± 2° C; HNO3 to pH <2 180 days Nitrate, nitrite, alkalinity, ammonia, chloride, sulfate, TBD TBD **Polys** Bottles provided by PEL phosphate, fluoride Cyanide 1L HDPE Cool to 4 ± 2° C, NaOH to pH>12 28 days IL Cool to 4.c = 20C PCB/PCS+/SVOC [LAmber **FIELD SCREENING SUMMARY** Date/ Time of Analysis Sample Analysis Method Results Notes 0.01 mg/1 Ferrous Iron Hach 8146

SAMPLER(S) SIGNATURE:

HANAGING THE VISI	DNO ENVIRONMENTAL ( F	ACILITIES   LOGISTICS		GF	TOUNDW	ATER SA	WPLIN	LUG				<del></del>	
SITE NAME	Smokey Mou	ntain Smeiters	·		SITE LOCAT	ION: Knoxville	, Tennessee			DATE	<u> </u>	<u>(27/3</u>	2012
WELL NO:	MWO				SAMPLE ID:	SMSN	MON	<del>}</del>		SAMP	LE TIME	-1021	
WEATHER		GENERAL OB	SERVA	HONS:	Surry	405	Bree	26				1025	·
	·					PURGING D							
Well Type:	Elish		l			ncoon o				Total V	Vell Dept	h (feet): 🔫	ا ه
Well Diamete	er (inches): Z	q:	Wate	r Quality I	Meter (and S/N)	451 550	6 064	2823 A	F	Screen	n Interval	(feet) 30.	-40
	eter (inches):3	• • •	Turbi	dity Meter	r (and S/N): [-	tach 210	0 Q 110	0000i#	<b>II</b>	1		Water (feet)	
Tubing Mate	rial: TF	<u>.</u>	Wate	r Level In	dicator (and S/N	): Solinst	016	153		Tubing	Depth	<u> 4 36.₀</u>	
1 WELL VOI	LUME PURGE	= (Total Well	Depth	- Static I	Depth to Water)	X Well Capacit				Volum	e to be P	urged (gallon:	s): 2 · 45
= (40	feet - 3	34.47 feet	) X	0.16	gallons/foot	=0.88	gallons	×3= 2	.45	Total \	/olume P	urged (gallon	s): <b>4.</b> 00
Time	Volume Purged (gal	Total Volume Purged (gal)	V V	pth to /ater 'eet)	Temp.	Specific Conductance Ins/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)		oidity (Us)	Odor/ Observ	vation
0941	6.25	0.25	34	.79	19.06	42. 28	1-14	6.35	295.4	53	2	Clone	فسا
0944	0.50	0.75	34.		18.81	42.95	0.61	4.30	288.8	23		`	۲,
0950	0.25	1.00	34.	६५	18.93	44.73	0.46	4.33	277.1	15		~	,
0959	0.50	1.50	<u>34.</u>	98	19.60	48.16	0.40	6.35	260.2	81.		-	
1005	6.50	2.00		<b>→</b>	19.15	47.64	0.33	6.33	259.0	69	<u>. 5</u>		
loll	0.50	2.50		· 10	19.42	50.10	0-28	6.31	757.4	40		4	
1010	0.50	3.00	_	20	19.04	48.40	0.33		262.8	45		clear	ing
1019	0.25	3.25	35.	25	18.89	49.43	0.27	4.30	270.8	54.	2	<u> </u>	<i>•</i>
					<u> </u>	<del>  :</del>		ļ <u> </u>		<u></u>	· 		
									ļ <del></del> ;	<u> </u>		<u>                                     </u>	
<u> </u>					<del> </del> -		· I	<del> </del>	<del> </del>			<del>-</del>	
<b> </b> -		<b> </b>			<del> </del>		·	<del> </del>		<u>                                      </u>		<del></del>	
W-!! O-mas	(O-1/54)(	0.040C	0.75	2 0 00:	42 004	85" 0.00 B	r 0.16. 0	0.07: 45	0.65. 5	" 100	en en	1.47. 102	= 5.88
Tubing İnsid	le Dlameter Ca	CMT = 0.0106, apacity (Gal/Ft)	): 1/8	' = 0.02; " = 0.000	1" = 0.04; 1 6; <b>3/16"</b> = 0.0	014; 1/4" = 0	.0026; 5/1	<b> 6"</b> = 0.004;	<b>3/8"</b> = 0.006		" = 0.010	); <b>5/8</b> " = 0.0	016
Stabilization	Criteria Rang	e: Tempera	ture:	<u>+</u> 0.2 °C;		AMPLING SU		red Oxygen: ±	0.2 mg/L,	рн: <u>+</u>	0.1 unit;	lurbidity	: <10 NTU
Field Filtered	I:(Ye):/ No	Duplicate:	Yes/I	No C	<del> </del>	<del></del>	<del></del>		<u> </u>		l —		· ]
Filter Size: _	5.45 ·	Duplicat Number		<u>&gt;</u> Typ	MSMW	) O ( /T Minimum Sampl	Tin	ne: 10	<u> 25 </u>		MS/MS	D: Yes/	
Samp	le Analysis	Containe		Conta		Volume		Prese	vation 	<u>.                                      </u>		Holding Tin	ne 
тс	L VOCs	'/ з	3		vials	Fill to Capacity	<del> </del>	Cool to 4° C;			<u> </u>	14 days	
	Metals + Hg	1	1	1 L H	<del></del>	1 L		ool to 4 ± 2° C;				180 days	
	s + Hg (filtered)	* 1	1	1 L H	IDPE	1 L	Co	ool to 4 ± 2° C;	HNO3 to pH	<2		1,80 days	
ammonia,	itrite, alkalinity, chloride, sulfate nate, fluoride	e, 2 #8b	2	Po	lys	TBD	<u> </u>	Bottles prov	ided by PEL				
	yanide	1	1	1L H	DPE	1 L		ool to 4 ± 2° C,				28 days	
PCB/R	st Svoc	- 6	6	1-Am	See FIELD	SCREENING		polto 4	'C = Z'	t.			
Samp	le Analysis	- 1		Method		Date/ Time of		+	uits		•	Notes	
Fer	rous Iron		H	ach 814	6	6/27/12	1100	0.0	79Mg/1		_		
												<u> </u>	<u>.                                     </u>
									<u>.                                    </u>				
SAMDI ED/	S) SIGNATURE			_		7)							
SAMPLEN(S	, oldin lone	. D	· · ·	U 1	Mle	火 /	.1	1111	Jc				
L	<u></u>	_ W	w		y - Co		<del>V</del>	y we	<del>0</del>		<del></del>	<del></del>	

WELL NO: NWO 8A WEATHER CONDITIONS/ GENERAL OBSERVATIONS:  Well Type: Flush Well Diameter (inches): Z-p  Tubing Diameter (inches) 3/L x / 4  Tubing Material: TE  Water Level Indicator (and S/N):  Well VOLUME PURGE = (Total Well Depth - Static Depth to Water) X Well Capacity  SAMPLE TIME: 1409  Mid 80's Brezy  PURGING DATA  Total Well Depth (feet): 35  Screen Interval (feet) 25  Screen Interval (feet) 25  Tubing Depth a  1 WELL VOLUME PURGE = (Total Well Depth - Static Depth to Water) X Well Capacity  Volume to be Purged (gallons): 5	CITE NAME									<b>1</b>				
WEATHER CONDITIONS/ GENERAL OBSERVATIONS:  Summy Mid 80'S Breezy  PURGING DATA  Well Type: Flush  Water Quality Meter (and S/N):  Tubing Diameter (inches): 316 x / 4  Tubing Material: TE  Water Level Indicator (and S/N):  Water Level Indicator (and S/N):  Well Capacity  Well Capacity  Wold 80'S Breezy  Purging DATA  Total Well Depth (feet): 35  Screen Interval (feet): 35  Screen Interval (feet): 35  Static Depth to Water (feet): 35  Tubing Material: TE  Water Level Indicator (and S/N):  Water Level Indicator (and S/N):  Volume to be Purged (gallons): 5	STIL NAME	: Smokey Moui	ntain Smelters	<u> </u>	SITE LOCAT	ON: Knoxville	, Tennessee			DATE: U	27/200			
WEATHER CONDITIONS/ GENERAL OBSERVATIONS:  Summy Mid 80's   Briezy    PURGING DATA  Well Type: Flush   Pump (and S/N):   As Same as vecorded    Total Well Depth (feet): 35    Water Quality Meter (and S/N):   Screen Interval (feet)    Tubing Diameter (inches): 31   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value   Value	WELL NO:	MW	8A		SAMPLE ID:	SMSI	BOWM	ŝA		SAMPLE TIME	1409			
Purging Data  Well Type: Flush Well Diameter (inches): 2. h Water Quality Meter (and S/N):  Tubing Diameter (inches): 3   L X   4	WEATHER	CONDITIONS/	GENERAL OB	SERVATIONS:		<del></del>								
Well Diameter (inches): 2. p  Tubing Diameter (inches): 3/16 × 1/4  Tubing Material: TE  Water Quality Meter (and S/N): Screen Interval (feet) 23  Water Level Indicator (and S/N): Tubing Depth - Static Depth to Water) X Well Capacity  Volume to be Purged (gallons): 5		·			<del></del>	/								
Tubing Diameter (inches): 7 Turbidity Meter (and S/N): Static Depth to Water (feet) 23  Tubing Material: The Water Level Indicator (and S/N): Tubing Material: Tubing Depth - Static Depth to Water) X Well Capacity  Tolume to be Purged (gallons): Static Depth to Water) Screen Interval (feet) 23  Tubing Diameter (inches): Static Depth to Water (feet) 23  Tubing Diameter (inches): Static Depth to Water (feet) 23  Tubing Diameter (inches): Static Depth to Water (feet) 23  Tubing Material: The Water Level Indicator (and S/N): Tubing Depth water (feet) 23  Tubing Material: The Water Level Indicator (and S/N): Tubing Depth water (feet) 23	Well Type:	Flush		Pump (and S/N	l):		C	_	-100	Total Well Dept	h (feet): 35			
Tubing Material: TFE Water Level Indicator (and S/N):  1 WELL VOLUME PURGE = (Total Well Depth - Static Depth to Water) X Well Capacity  Volume to be Purged (gallons): 5	Well Diamet	er (inches): 2	.∵µ	Water Quality N	Meter (and S/N)	JAS .	Some (	2 47°	1044 C	Screen Interval	(feet) 2 3-35			
Tubing Material: TFE Water Level Indicator (and S/N):  1 WELL VOLUME PURGE = (Total Well Depth - Static Depth to Water) X Well Capacity  Volume to be Purged (gallons): 5	Tubing Diam	neter (inches):3	11. 4 /14	Turbidity Meter	(and S/N):	7	422	O( )(+(	,	Static Depth to	Water (feet) 23.3			
1 WELL VOLUME PURGE = (Total Well Depth - Static Depth to Water) X Well Capacity  Volume to be Purged (gallons): 5			•	Water Level Inc	dicator (and S/N		BOOK.	*.		Tubing Depth	u.			
100 00 00 00 00 00 00 00 00 00 00 00 00	1 WELL VO			   Depth - Static I	Depth to Water)	X Well Capacit	у		<del>_</del>	Volume to be P	urged (gallons): 5. (			
= (35 feet - 23.3 feet) X O. ( callons/foot = 1.27 gallons \( \chi 3 = 5.0 \) Total Volume Purged (gallons): (	= ( 35	feet ~ 7	23.3 feet	× 0.10	gallons/foot	= 1.27	gallons	43 = 5	۱ ی.					
Volume Total Depth to Temp. Conductance Dissolved pH ORP Turbidity Odor/ Color		Volume		Depth to	T		Dissolved	рН	OPP	To such liditary	Oder ( Color			
fime Purged Purged (gal (gal) (feet) (°C) (ms/c/m or μS/cm (mg/L) (mlts) (mV) (NTUs) Observation	Time		Purged	(feet)	(°C)	<u>Cms/o</u> m <u>or</u> μS/cm			(mV)		Odor/ Color Observation			
1331 0.5 0.5 13.80 18.58 8.135 0.41 8.79 114.8 - cludy								<del></del>			Clondy			
1339 1.50 2.00 24.10 18.32 8.132 0.24 8.41 139.4 - " "										(	м <i>И</i>			
1349 1,50 3.30 27.05 18.86 8.380 0.88 8.07 110.7 037														
1559 1,00 4.50 6.15 18.40 6.573 0.17 8.71 10.5 287		<del></del>												
1401 1.00 5.50 24.15 18.42 8.441 0.14 8.74 15.8 166 " "											Clearer			
1107 100 (0.30 24.2 18.42 8.343 0.13 8.78 01.3 102	1107	1,00	6.30	67.2	18.90	0.312	0.15	8:10	11.3	102	- Cular			
			<u> </u>		-									
	·					<del> </del>				<del></del> ,	·			
							·			-				
			,,,,				-		· .					
Tubing inside Diameter Capacity (Gal/Ft): $1/8" = 0.0006$ ; $3/16" = 0.0014$ ; $1/4" = 0.0026$ ; $5/16" = 0.004$ ; $3/8" = 0.006$ ; $1/2" = 0.010$ ; $5/8" \approx 0.016$	Tubing Insi	de Diameter Ca	pacity (Gal/Ft)	): 1/8" = 0.000	6; <b>3/16"</b> = 0.0	014; $1/4'' = 0$	0.0026; <b>5/1</b>	<b>6"</b> = 0.004;	<b>3/8"</b> = 0.006	1/2" = 0.010				
SAMPLING SUMMARY				_	s	AMPLING SU	MMARY							
Field Filtered: Ves/No Duplicate: Yes/No Duplica	Field Filtered Filter Size:	d: Wes/No					Tim	ne:		MS/MS	D: Yes/			
Sample Analysis / Number of Containers Type of Container Volume Preservation Holding Time	Samp	le Analysis ,					е	Preser	vation		Holding Time			
TCL VOCs 3 40 mL vials Fill to Capacity Cool to 4° C; HCl to pH <2 14 days	TC	CL VOCs	3	40 mL	vials	Fill to Capacity		Cool to 4° C;	HCl to pH <2		14 days			
TAL Metals + Hg 1 1 L HDPE 1 L Cool to 4 ± 2° C; HNO ₃ to pH <2 180 days	TAL I	Metals + Hg	1	1 L HI	DPE	1 L	Co	ol to 4 ± 2° C;	HNO₃ to pH	<2	180 days			
TAL Metals + Hg (filtered)* 1 1 L HDPE 1 L Cool to 4 ± 2° C; HNO3 to pH <2 180 days		- ,	1	1 L HI	DPE	1 L	Co	ol to 4 ± 2° C;	HNO3 to pH	<2	180 days			
Nitrate, nitrite, alkalinity, ammonia, chloride, sulfate, phosphate, fluoride  TBD Polys TBD Bottles provided by PEL	ammonia,	chloride, sulfate	, тво	Pol	ys .	TBD		Bottles provi	ded by PEL					
Cyanide 1 1L HDPE 1L Cool to 4 ± 2° C, NaOH to pH>12 28 days		yanide	1	1L HE	DPE .	, 1L	Co	ool to 4 ± 2° C,	NaOH to pH>	-12	28 days			
PCD/PEST/SVOLS 6 IL Amber IL Cuol to 4. C = 2. C	Pas/	454/500	5 6	1L Am	ber	) L			C = 2 ·	٠				
FIELD SCREENING SUMMARY  Sample Analysis Method Date/ Time of Analysis Results Notes	Samo	le Analysis	<del></del>	Method	FIELL				ults		Notes			
Ferrous Iron Hach 8146 (1/27 //2 1420 0.0 mg/L		···			 S	1/27/	/							
		-				V			<del></del>					
SAMPLER(S) SIGNATURE:	0410.55	D) OLOMATICE		<u> </u>		<del>-                                    </del>		·						

MANAGING THE VISION®] ENVIRONMENTAL   FACILITIE	0	J.M.WALLER ASSOCIATES, INC.	
	MAHAGING TH	E VISION®] ENVIRONMENTAL	FACILITIE

	ION") EŅVIRONMENTAL I F	ACILITIES	LOGISTICS		GR	OUNDW	ATE	RSA	MP	LINC	G LOG					
SITE NAME	: Smokey Mou	ntain \$	Smelters			SITE LOCAT	ION: Kr	oxville	, Tenn	essee			DATE	: 6/	27/20	012
WELL NO:	M	1al	4A	•		SAMPLE ID:					4A	-		LE TIME		1540
	CONDITIONS/			SERV	ATIONS:	Sum		M/M				(120	, Grain	,,,,_	·	
							77	ING D		<u> </u>		<u> </u>				
Well Type:	Elush			Pun	np (and S/N	):	1	^		# In /	1	0	Total \	Vell Dept	th (feet): 🚜	3
Well Diamete	er (inches): 2	.0		Wat	ter Quality M	Meter (and S/N)	.   3	) auv	y a	> 44	cordia 5 of book	,	Scree	n Interval	(feet)	33-47 
Tubing Diam	eter (inches):		ليداب	Turt	oidity Meter	(and S/N):	4	ď	```	8	5 05		Static	Depth to	Water (feet)	22 1 A
Tubing Mate			^''7		_	licator (and S/N		,	YW	5	book					-
	17						`. <i>J</i>		•						439.	
	LUME PURGE	- 1									<i>^</i> -				urged (gallons	- <b>7</b> [
= (43	feet –	<u>38:</u>	<b>20</b> feet)	) ×	0.16	gallons/foot	- <b>(</b> )	$\cdot \gamma \varphi$	) ga	illons	X3 (= 2	1.50	Total \	/olume P	urged (gallons	» <u>2/75</u>
Time	Volume		fotal olume		epth to	Temp.	Conduc	rtance		olved	pH	ORP	Turl	oidlty	Odor/	Color
Time	Purged (gal		urged (gal)		Water (feet)	(°C)	(ms/c)			gen g/L)	(standard units)	(mV)	(N1	ľUs)	Observ	
1521	0.75	0.	75	38	.70	19.02	19.	05	0.8	81	5.63	169.9	46	7	O van	- (/.
1525	0.56		25	38	.90	18.40	19.2	14	0.3	54	5.59	184.5	39	<u>ľ</u>	4	• \
1530	Ø.06	_	<b>15</b> 21	330	705	18.55	19.8		0.	-	5.64	175.4	17		4	٠,
1533	0.3500			-		18.65	20.		03		5.04	171.9	10.		u	
1535	0.25	2.	75	39	7.10	18.42	20.	84	0.	32	5.64	170.1	79	<u>:3</u>	ч	
			· _												_ *	
					-		<u> </u>									
							-					_				
				-										*		
					-	<del></del>	<del> </del>									<del></del> ]]
						<del> </del>	<del>                                     </del>			<del></del>						
						<del></del>	<u> </u>					- 1				
Well Canaci	ty (Gal/Ft): C	MT -	0.0106-	0.75	5" = 0.02;	<b>1</b> " ≈ 0.04; 1	.25" = 0.6	)6· 2'	" = 0.16	3 3"	= 0.37; 4"	= 0.65; 5	" = 1.02;	6" –	1.47; <b>12"</b> =	= 5.88
Tubing insid	de Diameter Ca Criteria Rango	pacity	y (Gal/Ft)	: 1/	/8" = 0.0006	6; 3/16" = 0.0 Specific Co	0014; 1	/4"=0.	.0026;	5/1	6" = 0.004; ad Oxygen: ±	3/8" = 0.006	; 1/2	" = 0.010 0.1 unit;		16
Gtabilization	i ontena nangi		remperat		10.2 0,		AMPLIN				au Oxygen. <u>+</u>	o.z mg/c,	pri. <u>T</u>	O. T GITH,	Turbialty.	CIONIO
Field Filtered	l: Gs/No		Ouplicate:	Yes/	10		7-4011 MIL									
Filter Size: _	<u> </u>		Duplicate Number		_ <del>`</del> Type	of I	Vilnimum	Sample	e	Tim				MS/MS	D: Yes/NO	
	le Analysis		Containe		Conta	iner	Volu	me .			Preser				Holding Tim	ie
	L VOCs '	<i>i</i>	3		40 mL		Fill to Ca				Cool to 4° C;	<u>`</u>			14 days	
	Metals + Hg	, ,	1 		1 L HC		1 L	-			ol to 4 ± 2° C;				180 days	
	s + Hg (filtered)*	+	1		1 L HE	DRE -	1 L			Co	ol to 4 ± 2° C;	HNO3 to pH	<2		180 days	
ammonia,	itrite, alkalinity, chloride, sulfate	,	∓ <del>BD</del>	2	Poly	/s	ТВ	D	Ì		Bottles provi	ded by PEL			: "	}
	nate, fluoride  yanide				1L HD	NDE	1 L			Co	ol to 4 ± 2° C,	NaOH to nHs	10		OD dove	
D W/D	SH/SVOC		<del>- [-</del>			ber					1 to 4.6	12°C	14		28 days	
			<del></del>			FIELI	SCREE	ENING				_				
	le Analysis	$\perp$			Method		Date/	Time o		,	Resu	ilts			Notes	
- Fer	rous Iron	-	,		Hach 8146		6124	112	16	:05	0.03	MZIL	· -		<u> </u>	
		+				<u> </u>	<del> </del>							· _		
							<u></u>		<del></del>	<u>_</u>	<u> </u>					
SAMPLER(S	S) SIGNATURE	;	$\forall$	<del>)                                    </del>		M/			$\top$		70.0					

I.M.WALLER' ASSOCIATES, INC. HANAGING THE VISION'   ENVIRONMENTAL   FACILITIES   LOGISTICS	GROUNI	OWATER SAMPL	ING LOG			
SITE NAME: Smokey Mountain Smelters		CATION: Knoxville, Tenne		DATE: 4/28/2012		
WELL NO: MWO7A	SAMPLE	0 = 5	SAMPLE TIME: 0920			
WEATHER CONDITIONS/ GENERAL OB:	SEDVATIONS:			SAMPLE TIME: 0 120		
	<u> </u>		40'5 - Low 70.5/			
Well Type: Flush	Pump (and S/N):	FURGING DATA	6017	Total Well Depth (feet): 7 3		
• •	1					
Well Diameter (inches): 2.7	Water Quality Meter (and	S/N): 451 556 11	10102122	Screen Interval (feet) 13-23		
Tubing Diameter (inches):3); 51/4		•	110800011535	Static Depth to Water (feet) 18.81		
Tubing Material: TFE	Water Level Indicator (and	ds/n): Salinst	901847	Tubing Depth Z2 422.0		
1 WELL VOLUME PURGE = (Total Well	Depth - Static Depth to W	ater) X Well Capacity	<del></del>	Volume to be Purged (gallons): 7.0/		
= ( 23 feet - 18.81 feet	× o.l o gallons/foo	t = 0.67 ga	llons 43 = 2.01	Total Volume Purged (gallons): 3. 7		
Volume Yolume	Depth to Tomp	Specific Disso	olved pH opp	Turbidity Odor/ Color		
Time Purged Purged (gal (gal)	Water (°C)			(NTUs) Observation		
0841 - 0.25	18.90 17.9	<del></del>	3 6.23 176.1	- Grans		
0850 0.75 1.0	19.20 17.7	1/ 53.25 0.	<del></del>			
0855 0.75 1.15	19.28 17.7	1 54.73 0.0	<del></del>	7 800 - 2		
0902 0.75 2.50	19.20 17.8	9 56.68 0.8		744 - ~		
0912 6.50 3.00	18-38-1 18-30		56 6.19 155.9	151		
0914 0.50 3.50	19.25 18.10	58.04 0.4	12 6.17 156.1	184 ~ 3		
0919 0.25 3.75	19.23 18.0	57.92 0.	59 6.18 155.8	147 - 7		
·			·			
	,					
		<del></del>				
		<del></del>	<del>  </del>			
				<u> </u>		
Well Capacity (Gal/Ft): CMT = 0.0106; Tubing Inside Diameter Capacity (Gal/Ft) Stabilization Criteria Range: Tempera	): 1/8" = 0.0006; 3/16"	l: 1.25" = 0.06; 2" = 0.16 = 0.0014; 1/4" = 0.0026; c Conductance: ± 5%; D	3; 3" = 0.37; 4" ≈ 0.65; 5' 5/16" = 0.004; 3/8" = 0.006 vissolved Oxygen: ± 0.2 mg/L,	" = 1.02; 6" = 1.47; 12" = 5.88 6; 1/2" = 0.010; 5/8" = 0.016 pH: ± 0.1 unit; Turbidity: <10 NTU		
		SAMPLING SUMMAR	Y	Paa		
Field Filtered: Yes No Duplicate: Duplicate: Duplicate:			Time:	MS/MSD: (Ves/No)		
Sample Analysis Number Contains	r of Type of	Minimum Sample Volume	Preservation	Holding Time		
TCL VOCs ', 3	40 mL vials	Fill to Capacity	Cool to 4° C; HCl to pH <2	14 days		
TAL Metals + Hg , 1	1 L HDPE	1 L	Cool to 4 ± 2° C; HNO ₃ to pH	<2 180 days		
TAL Metals + Hg (filtered)* 1	1 L HDPE	1 L	Cool to 4 ± 2° C; HNO3 to pH	<2 180 days		
Nitrate, nitrite, alkalinity, ammonia, chloride, sulfate, phosphate, fluoride	Polys	TBD	Bottles provided by PEL			
Cyanide 1	1L HDPE	1 L .	Cool to 4 ± 2° C, NaOH to pH>	12 28 days		
PCD PLST SVOC 4	(LAMLER F	IELD SCREENING SUMI	(80) to 4°C + 2°C	,		
Sample Analysis	Method	Date/ Time of Analy		Notes		
Ferrous Iron	Hach 8146	6/28/12 09	43 O.0 Mg/L			

SAMPLER(S) SIGNATURE:

STE NAME: Smokey Mountain Semetrics	MANAGING THE VISION	ENVIPONMENTAL   F	ACILITIES   LOGISTICS	GF GF	ROUNDW	ATER SA	MPLING	G LOG					_
West Type:   FILES	SITE NAME: S	mokey Mou	ntain Smelters	<u>.                                    </u>	SITE LOCAT	ION: Knoxville	, Tennessee			DATE:	41	28/2012	
Well Type:   FLUSh	WELL NO:	MW	073		SAMPLE ID:	SMS	MW 0	73		SAMPI	LE TIME	: 49 58	
Well Type:   FLASh	WEATHER CO	NDITIONS/	GENERAL OB	SERVATIONS:	Service	1 442	5 60'S						
Well Diameter (Inches)   2:1   Water Quality Meter (and SN): Y \$1 55C, 06H 2873 AF   Screen Interval (feet) 30-40   Tubring Diameter (Inches)   3   K x   Y y   Tubring Material: TE   Water Level Indicator (and SN): Hack 2100 Q 116 50C 11535   Static Dapith to Water (Seet) 20-4   Tubring Material: TE   Water Level Indicator (and SN): SQLV ST 016 953   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Depth ~ 25.0   Tubring Dept	<u></u>				0	PURGING I							
Tubing Diameter (inches) 3	Well Type:	-lush		Pump (and S/I	V): 55 M	ONSOON	0167	15		Total W	/ell Dep	th (feet): 40	
Tubing Diameter (inches) 3	,		4:	Water Quality	Meter (and S/N)	4 51 55	C 6643	2823 Ai	F	Screen	Interval	(feet) 30-47	>
TWELL VOLUME PURGE	Tubing Diamete	er (inches):3	110 × 114	Turbidity Mete	r (and S/N):	Hach 21	00 Q 11	68 0C6 11	535	Static E	epth to	Water (feet) 20.	į
TWELL VOLUME PURPOR	Tubing Materia	" TF	F.	Water Level In	dicator (and S/N	DE Solvens	st 016	953		Tubing	Depth	٠25.0	
Time	1	ME PURGE	= (Total Well	Depth - Static	Depth to Water)	X Well Capacit				Volume	to be F	Purged (gallons): 💁.	40
Time	= (40	feet - (	20.4 feet	× 0.16	gallons/foot	= 3.13	gallons	9.40		Total V	olume P	urged (gallons): <b>q</b>	50
0878   0.75   21.10   17.86   95.71   238   5.82   243.5   94.0   34.0   34.3   35.3   21.10   17.80   10.2.7   0.73   5.74   24.8   5.38   Cloudy-State   0.83.5   1.80   1.80   1.90   21.10   18.05   10.3.1   0.3.3   5.77   226.4   17.6   Clearly   0.858   1.80   5.90   21.10   17.82   0.2.1   0.3.0   5.77   225.4   17.3   Clearly   0.904   1.90   0.90   21.10   17.91   102.4   0.24   5.17   284.9   24.4   Clearly   0.904   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90   1.90	Time	Purged	Volume Purged	Water	Temp.	ms/cmor	Oxygen	(standard				Observation	
0   5   2   0   4   0   2   1   0   18   05   103   1   0   33   5   7   7   724   4   71   0   C   C   0   0   0   0   0   5   0   0   0   1   18   2   0   2   0   0   3   0   5   7   7   7   25   9   4   2   3   C   C   2   1   0   0   0   0   0   0   0   0   0	0858			21.10	17.86	<del></del>	238	5.82	243.5	94.	v	Strate	
0												Cloudy-or	an
0904   1.00   0.00   21.10   17.91   102.4   0.26   5.77   234.5   7.4.6   Clearing   0910   1.00   1.00   21.10   17.94   102.3   0.25   5.77   237.6   (6.7 )   092.7   1.50   0.00   21.10   17.97   102.3   0.25   5.79   237.2   12.00   092.7   1.50   9.50   9.10   17.97   102.3   0.23   0.23   5.50   229.7   8.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.65   7.6		2.00	4.0	21.10	18.05		0.33	5.77			_	Cleanin	
1.00   1.00   1.00   2 :  0   17.94    02.3   0.25   5.77   237.2   12.6   7.97   0.20   0.24   1.5.79   0.23   0.24   5.79   237.2   12.6   0.27   0.27   1.50   0.26   0.24   1.25"   0.06;  0.23   0.24   5.79   237.2   12.6   0.26   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.27   0.25   0.25   0.27   0.25   0.25   0.27   0.25   0.25   0.27   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25   0.25	0858	(.00	5.00	21.10	17.82	102.1	0.30	5.77	225.9				
Well Capacity (Gel/Ft): CMT = 0.0106, 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88	0904	1.00		21.10	17.91	102.4	0.26	5.77	2849	24	٠.	Clearin	4
Well Capacity (Gal/Ft): CMT = 0.016. 0.75" = 0.02: 1" = 0.04: 1.28" = 0.06: 2" = 0.16: 3" = 0.37: 4" = 0.65: 5" = 1.02: 6" = 1.47: 12" = 5.88	2910	1. లు	7.00		<del></del>	102-3	0.25	5.77	239.(	16-	}_	<u> </u>	<u> </u>
Well Capacity (Gal/Ft): CMT = 0.016. 0.75" = 0.02: 1" = 0.04: 1.25" = 0.06: 2" = 0.16: 3" = 0.37: 4" = 0.85: 5" = 1.02: 6" = 1.47: 12" = 5.88		1.00		21.10		102.3	0.24		237.2	12.	<u>Q</u>	L .	_{
Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0016; 3/16" = 0.0016; 1/2" = 0.010; 5/8" = 0.016   Stabilization Criteria Range: Temperature: ± 0.2 °C; Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L, pH: ± 0.1 unit; Turbidity: <10 NTU	0927	1.50	9.50	21.10	(8.00	102.3	0.23	5.20	229.7	8.0	25_		_#
Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0016; 3/16" = 0.0016; 1/2" = 0.010; 5/8" = 0.016   Stabilization Criteria Range: Temperature: ± 0.2 °C; Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L, pH: ± 0.1 unit; Turbidity: <10 NTU	ļ — — — — — — — — — — — — — — — — — — —				<del> </del> -		<u> </u>	<del> </del>	<del> </del>	<u> </u>		<del>                                     </del>	
Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0016; 3/16" = 0.0016; 1/2" = 0.010; 5/8" = 0.016   Stabilization Criteria Range: Temperature: ± 0.2 °C; Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L, pH: ± 0.1 unit; Turbidity: <10 NTU	<b>-</b>			<u> </u>	<del> </del> -	<u> </u>		<del> </del>	<del> </del>				{
Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0016; 3/16" = 0.0016; 1/2" = 0.010; 5/8" = 0.016   Stabilization Criteria Range: Temperature: ± 0.2 °C; Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L, pH: ± 0.1 unit; Turbidity: <10 NTU	<b>⊩</b> ——∔			<u> </u>	<del>}</del>	<del> </del>	<u> </u>	<del> </del> -	<del>  ;</del>			<del> </del>	
Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0016; 3/16" = 0.0016; 1/4" = 0.0026; 5/16" = 0.006; 1/2" = 0.010; 5/8" = 0.016   Stabilization Criteria Range: Temperature: ± 0.2 °C; Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L, pH: ± 0.1 unit; Turbidity: <10 NTU   SAMPLING SUMMARY				<del></del>	<del></del>	· ·	ļ	<del> </del>	<del>                                     </del>			<u> </u>	
Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0016; 3/16" = 0.0016; 1/4" = 0.0026; 5/16" = 0.006; 1/2" = 0.010; 5/8" = 0.016   Stabilization Criteria Range: Temperature: ± 0.2 °C; Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L, pH: ± 0.1 unit; Turbidity: <10 NTU   SAMPLING SUMMARY	<u> </u>				<u></u>	<u> </u>		<u></u>			==		<u> </u>
Filed Filtered: (25 No Duplicate: Yes/ No Duplicate: Yes/ No Duplicate: Yes/ No Duplicate: Yes/ No Duplicate: D:  Sample Analysis	Tubing Inside Stabilization C	Diameter Ca riteria Range	pacity (Gal/Ft)	): 1/8" = 0.000	6; <b>3/16</b> " = 0.0	0014; <b>1/4"</b> = 0	.0026; <b>5/</b> 1	<b>16"</b> = 0.004;	3/8" = 0.006	; 1/2°	= 0.010	); <b>5/8"</b> = 0.016	TU
Duplicate ID:   Duplicate ID:   Type of Container   Number of Container   Container   Preservation   Holding Time					s	AMPLING SU	MMARY	-	۔ ۔ ۔				
TCL VOCs   3   40 mL vials   Fill to Capacity   Cool to 4° C; HCl to pH <2   14 days	Field Filtered:	(es No)					Tin	ne:			MS/MS	SD: Yes/ N	
TAL Metals + Hg	Sample	Analysis					e	Preser	vation	ļ		Holding Time	
Nitrate, nitrite, alkalinity, ammonia, chloride, sulfate, phosphate, fluoride  Cyanide  1 1L HDPE  1	TCL	VOCs	3	40 ml	vials	Fill to Capacity		Cool to 4° C;	HCl to pH <2			14 days	
Nitrate, nitrite, alkalinity, ammonia, chloride, sulfate, phosphate, fluoride  Cyanide  1 1L HDPE  1 Cool to 4 ± 2° C, NaOH to pH>12 28 days  P(S+ PCB SVDC    CAMPSV  FIELD SCREENING SUMMARY    Sample Analysis   Method   Date/Time of Analysis   Results   Notes	TAL Met	tals + Hg	1 1	1 L H	DPE	1 L	Co	ool to 4 ± 2° C;	HNO₃ to pH	<2		180 days	,
ammonia, chloride, sulfate phosphate, fluoride  Cyanide  1 1L HDPE  1 L Cool to 4 ± 2° C, NaOH to pH>12  28 days  P(S+ /PCb   SVDC    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH to pH>12    Cool to 4 ± 2° C, NaOH	- TAL Metals 1	Hg (filtered)			DPE			ol to 4 ± 2° C;	HI4 <del>O0 to p</del> ⊢L	-2		180 days	3
P(St / PCD   SVDC     Cool to 4°C = 2°C    Sample Analysis   Method   Date/ Time of Analysis   Results   Notes    Ferrous Iron   Hach 8146   (a/28/12 0950 0.00 (Mg)   L	ammonia, chi	loride, sulfate	, тво	2 Po	lys	TBD		Bottles prov	ided by PEL				
FIELD SCREENING SUMMARY  Sample Analysis Method Date/ Time of Analysis Results Notes  Ferrous iron Hach 8146 (0/28/12 0950 0.00 (MS))	Cya	ınide	1	1LH	DPE	1 L	C		•	12		28 days	
Sample Analysis Method Date/ Time of Analysis Results Notes  Ferrous Iron Hach 8146 (0/28/12 0950 0.00 IMS/L	Pest/PCB	SVOC	Ь	[UA					C = 5.c				
Ferrous Iron Hach 8146 6/28/12 0950 0.00 MS/L	Sample	Analysis		Method					ults			Notes	
					6 -	10/28/12		<del></del>	CL				
SAMPLER(S) SIGNATURE: Lul Jehry.					<del></del> -		<u></u>		J'-				$\neg$
SAMPLER(S) SIGNATURE: Lund Jehns.								T					
SAINIPLER(S) SIGNATURE: Luly Jehry.	CANSIDO	BIONATUS"					1 -						=
	SAMPLEH(S)	SIGNATURE:	· L	ي بلام م	N 1.	_ \	12	PLA	a/ ·				1
					$-\chi$	<u>~</u> _	1		<del>0</del>			<u> </u>	



_	OCIATES, INC.	ACILITIES   LOGISTICS	GF	ROUNDW	ATER SA	AMPLING	LOG			•		
SITE NAME: Smokey Mountain Smelters SITE LOCATION: Knoxville, Tennessee DATE: (0 (28/2012												
WELL NO:	MW	03B	SERVATIONS:	SAMPLE ID:	SMS	KWBB	A		SAMPLE T	(11.0.2		
WEATHER (	CONDITIONS/	GENERAL OB	SERVATIONS:	Sunn		1 Bru			<u> </u>			
-					PURGING I		<del>0 0</del>					
Well Type:	ZW F	lush	Pump (and S/N	1)	Samo	e as ve	carda	0	Total Well	Depth (feet): 66		
Well Diamete	er (inches): 7	4:2	Water Quality I	Meter (and S/N)					Screen Inte	erval (feet) 56-46		
Tubing Diam	eter (inches): 3	11. 114	Turbidity Meter	(and S/N):	7	P89 oK.	יי ט	0)		h to Water (feet) 35.66		
Tubing Mate			Water Level In	dicator (and S/N		D T.			Tubing Dep			
	( 4 (		Depth – Static I	,	<u> </u>	h,				~ (e 77.0		
= ( 44		•			= 4.85	•	k3 = 14	161		be Purged (gallons): 14.70		
- ( <b>υ υ</b>	1001 -		×OIL	ganoris/100t		ganons	<u> የ</u>	(.76	Total Volun	ne Purged (gallons): / ۲۰٦		
Time	Volume Purged	Total Volume	Depth to Water	Temp.	Specific Conductance	Dissolved Oxygen	pH (standard	ORP	Turbidity			
	(gal	Purged (gal)	(feet)	(°C)	ms/cm <u>or</u> μs/cm	(mg/L)	units)	(mV)	(NTUs)	_		
1041	ტ.50	0.50	39.80	18.81	115.9	4.01	5.51	192.8	7600	Cloudy		
1054	<b>4.</b> 75	2.25	42.80	19.23	111.5	0.40	5.50	170.0	7800	66 4		
1120	2.75	5.00	43.80	19.98	115.2	0.26	5.52	179.2	<u> 300</u>	clearing		
1207	5.25	10.25	43.80	19.08	113.2	0.24	5.50	170.4	418 172	Cloudy		
26	0.75	12.50	1230-1	330 Lu		0.17 ed off	5.30	154.5	112	- Clu 7		
1342	1.5	1280	39.75	181.87		0.89	5.52	491	(e7.(	Greyish		
1347	147 0.75 13.25 39.45				112.3	0.43	5.47	173.3	51.3			
352	0.50	1375	41.05	19.01	113.4	0.30	5.49	171.8	44.2			
13 55	0.22	14.00	41.12	19.35	113.5	0.27	5.48	169.0				
1400	0.75	14.35	41.12	19:39	113.6	0.25	5.48	166.7	28.0	• •		
			<u>'</u>					,				
Mall Canaci	(Cal/Et)	NT 0.0108	0.757 0.00	17 004 1			0.07: 42	0.05. 5	1 400	CP 447 407 500		
Fubing İnsid	ty (Gal/Ft): C le Diameter Ca Criteria Range	pacity (Gal/Ft)	<b>0.75"</b> = 0.02; ): <b>1/8"</b> = 0.000 ture: <u>+</u> 0.2 °C;			0.0026; <b>5/1</b>	= 0.37; 4" 6" = 0.004; ed Oxygen: <u>+</u>	<b>3/8"</b> ≈ 0.006				
	<u> </u>	W.F.		s	AMPLING SU	IMMARY						
Field Filtered Filter Size: _	: [Yes] No. 4 <	Duplicate: Duplicat	: <b>Ve3</b> /No e ID:S	MSMW	903B	Tim	1e: 140	5	мя	S/MSD: Yes		
Sampl	e Analysis	Number Contains			Winimum Samp Volume	ie	Preser	vation		Holding Time		
TC	L VOCs	3	40 mL	vials	Fill to Capacity		Cool to 4° C;	HCl to pH <2		14 days		
TAL M	letals + Hg	1	1 L H	DPE	1 L	Co	ol to 4 ± 2° C;	HNO₃ to pH	<2	180 days		
TAL Metals	÷ Hg (filtered)	1	1 L H	DPE	1L	Co	ol to 4 ± 2° C;	HNO3 to pH	<2	180 days		
ammonia, o	trite, alkalinity, chloride, sulfate ate, fluoride	, тве	<b>`</b> }_ Pol	ys	TBD		Bottles provi	ded by PEL				
c	yanide	1	1L HI	OPE	1 L	<b>I</b>	ool to 4 ± 2° C,			28 days		
PCO Post SVOC G 1 Awar 1 Cool to 4.5 \$2.00												
	e Analysis		Method		Date/ Time		Res			Notes		
Fer	rous Iron		Hach 8146		6/28/12	1425	0,3	B mg/L	- 0	Lean Sampl		
···					<u> </u>							
SAMPLER(S	) SIGNATURE	:	1. ()	71/	′ .	/ c	101	1				



HANAGING THE VIS	ION"   ENVIRONMENTAL   FA	CILITIES   LOGISTICS	<u>G</u>	HOONDA	VATER SA	MIPLING	a LUG				<del></del>						
SITE NAME	: Smokey Moun	tain Smelters	<u> </u>	SITE LOCA	TION: Knoxville	, Tennessee	·	· 	DATE:		·						
WELL NO:	CONDITIONS/ G	ENEDAL OB	SEDVATIONS.	SAMPLE ID	<u> </u>	<del></del>	·		SAMPL	E TIME	<u>.</u>						
WEATHER		ENERAL OB			<u> </u>	<del></del>				 	/						
r <del>=</del>			· · · · · · · · · · · · · · · · · · ·		PURGING D	ATA		<u> </u>									
Well Type:			Pump (and S	/N):		• .		•	Total Well Depth (feet):								
Well Diamet	er (inches):		Water Quality Meter (and S/N):														
Tubing Diam	eter (inches):	•	Turbidity Met	er (and S/N):					Static Depth to Water (feet)								
Tubing Mate	rial:		Water Level I	ndicator (and S/	N):				Tubing	Depth							
1 WELL VO	LUME PURGE	= (Total Well	Depth ~ Statio	Depth to Water	) X Well Capacit	у			Volume	to be P	urged (gallons):						
= (	feet –	feet)	) X	gallons/foot	=	gallons		/	Total Vo	olume P	urged (gallons):						
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbi (NTI		Odor/ Color Observation						
							. /										
<u> </u>				<del></del>	<u></u>												
<b></b> _	<del>                                     </del>	<del></del>		<del></del>	<u></u>	 		ļ									
[ <del></del> -	<del> </del>				<del></del>	-		<del> </del>	<del>-</del> /								
<del></del>											<u> </u>						
<del></del>	<del>                                     </del>	· <del>-</del>			+		X ()	1,1		<del></del> :							
	<del>                                     </del>	1	1-0	1	10)	7	(	1/	-								
			7	5	4		10/	7-1-									
				J			160	ļ									
				77		2	00				·						
	ļ				/	· · · · · · · · · · · · · · · · · · ·	\ <u> </u>	<u> </u>									
							<u> </u>	<u></u>		_							
Tubing Insid	ty (Gal/Ft): Cl de Diameter Cap n Criteria Range	pacity (Gal/Ft)	0.75" = 0.02; : 1/8" = 0.00 ture: <u>+</u> 0.2 °C	106: <b>3/1∕6"</b> ≂ 0	1.25" = 0.06; 2 .0014; 1/4" = 0 enductance: ± 5%	" = 0.16; 3" .0026; 5/1 s; Dissolv	= 0.37; 4"  6" = 0.004;  ed Oxygen: <u>+</u>	3/8" = 0.006			1.47; 12" = 5.88 ; 5/8" = 0.016 Turbidity: <10 NTU						
. <del>_</del>	_ <del></del>	<del></del>			SAMPLING SU	MMARY		<del>_</del>									
Field Filtered Filter Size:	d: Yes/No	Duplicate: Duplicate		/ ·		Tim	ne:			MS/MS	D: Yes/No						
Samp	le Analysis	Number Containe	of Ty	pe of tainer	Minlmum Sampl Volume	9	Preser	vation			Holding Time						
TC	L VOCs	3	40 m	L vials	Fill to Capacity		Cool to 4° C;	HCl to pH <2			14 days						
TAL N	/letals + Hg	1	/ 1L	HDPE	1 L	Co	ool to 4 ± 2° C;	HNO₃ to pH	<2	<u> </u>	180 days						
TAL Metal	s + Hg (filtered)*	1/	1 L	HDPE	1L .	Co	ool to 4 ± 2° C;	HNO3 to pH	<2		180 days						
ammonia,	itrite, alkalinity, chloride, sulfate, nate, fluoride	тво	Р	olys	TBD		Bottles provi	ided by PEL									
Ċ	yanide	1	1L	HDPE	1 L	Co	ool to 4 ± 2° C,	NaOH to pH>	12		28 days						
		•		FIEL	D SCREENING	SUMMARY	,	••									
Samp	le Analysis	<b></b>	Method		Date/ Time of		Res	ults			Notes						
Fer	rous Iron	<del></del>	Hach 81		· · · · · · · · · · · · · · · · · · ·												
				<del></del>		·	<u> </u>	<u> </u>									
and produced																	
04401-00	O CIONATURE									_;							
SAMPLEH(	S) SIGNATURE:	•								÷							

# **SMOKEY MOUNTAIN SMELTERS**

KNOXVILLE, TENNESSEE

## December 2012 ( angle) RI/FS Phase 2 Groundwater Re-Sampling Event

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## Groundwater Sampling Log Book 1 of 1 118.30

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MANAGING THE VISION® | ENVIRONMENTAL | FACILITIES | LOGISTICS

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12/11/2012
  0830 Begin opening wells.
  1900 Begin worker level readings
True 2012 readings
(25.9)
                        (25.8)
 MW10B = 29.41
                        (14.94)
   MWOZA = 16.59
   MWO1A = 36.91
                        (34,47)
                        (35.44)
   MW03B = 37.77
                       (38.20)
   MW04A - 40.85
MW08A = 26.00
                        (23.3)
_ MWO7BA = 21.47
                       (18.81)
                       (20.4)
MW07B=23.00
```

Notes
1045 MW07A projed dry.
1125 At MW07B (1eft primp inMW07A, moved all other equipment to MW07B.) Trouble with
1125 At MW07B (1eft primp inMW07A, moved all other equipment to mw07B.) Trouble with
1145 Primp of control - on phone w/ Pine to trouble shoot. (TC onsite w/ surreyor).
1145 Primp is bad. Knowle fine has a Norson replacement
1145 Primp is bad. Knowle fine has a Norson replacement while films
1515 At MW07B with peristaltic primp. 2 wal primp bad quite divine Sample bottes
1515 At MW07B with peristaltic primp. 2 wal primp bad quite divine Sample bottes
1516 At MW07B with peristaltic primp. 2 wal primp bad quite for replacement espiparate.
1517 At MW07B with peristaltic primp. 2 wal primp bad quite for replacement espiparate.
1518 At MW07B with peristaltic primp. 2 wal primp bad quite.
1519 At MW07B with peristaltic primp. 2 wal primp bad quite.
1519 At MW07B with peristaltic primp. 2 wal primp bad quite for replacement espiparate.
1519 At MW07B with peristaltic primp. 2 wal primp bad quite for replacement espiparate.
1519 At MW07B with peristaltic primp. 2 wal primp bad quite for replacement espiparate.
1519 At MW07B with peristaltic primp. 2 wal primp bad quite for replacement espiparate.
1519 At MW07B with peristaltic primp. 2 wal primp bad quite for replacement.

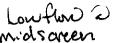


CAN ASS	A.WALLER SOCIATES, INC.	FACILITIES   LOGISTICS	GR	OUNDW	ATER SA	MPLING	LOG					
SITE NAME	: Smokey Mou	ntain Smelters	;	SITE LOCAT	ION: Knoxville	, Tennessee			DATE:			
WELL NO: N		GENERAL OBS	MW 10 A	SAMPLE ID:	SM <del>OMW</del> TOA	SM S MV	UCZASN	nsmwioa	SAMP	LE TIME:		
<del></del>	<del></del>		<del>_</del> _		PURGING D	ATA						
Well Type:			Pump (and S/N	):					Total V	vell Depti	h (feet): 32	
Well Diamete	er (inches):		Water Quality N	Meter (and S/N)	S/N):					Screen Interval (feet) 22-32		
Tubina Diam	eter (inches):		Turbidity Meter	(and S/N)	nd S/N):					Static Depth to Water (feet)		
-	, ,								Tubing Depth			
Tubing Mate					cator (and S/N):					_		
		-	Depth - Static D					#			urged (gallons):	
= (	feet	reet	) X (	gallons/foot	=	gallons			Total V	olume Pu	urged (gallons):	
Time	Volume Purged (gai	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)		Odor/ Color Observation	
1690	Bigin pe	my - 1	veu d	n. 1	Do Wood	وح عل	all.					
<u> </u>	ייט			_							· .	
			<u>.</u>									
	-										. 7.	
Tubing Insid	ty (Gal/Ft):      C le Diameter Ca Criteria Rang	CMT = 0.0106, pacity (Gal/Ft) e: Tempera	0.75" = 0.02; : 1/8" = 0.0006 ture: ± 0.2 °C;		.25" = 0.06; 2 014; 1/4" = 0 nductance: ± 5%	0026; 5/10	= 0.37; 4" 6" = 0.004; ed Oxygen: ±	3/8" = 0.006		6" = " = 0.010 0.1 unit;		
				s	AMPLING SUI	MMARY	<u></u>	_				
Field Filtered Filter Size:	: Yes/No —————	Duplicate: Duplicate				Tim	e:			MS/MS	D: Yes/No	
Sampl	e Analysis	Number Containe			inimum Sample Volume		Preserv	vation			Holding Time	
тс	L VOCs	3	40 mL	vials	Fill to Capacity		Cool to 4° C;	HCl to pH <2			14 days	
	letals + Hg	1	1 L H0		1 L		ol to 4 ± 2° C;	·		ļ	180 days	
TAL Metals	s + Hg (filtered)	1	1 L HE	OPE	1 L	Coo	of to 4 ± 2° C;	HNO3 to pH	<2		180 days	
TCL Pest/PCBs 4 1 L Amber glas					4 L		Cool to	4° C		7 days	s to extract, 40 days to analyze	
	yanide	1	1L, HC	PE	1 L	Co	ol to 4 ± 2° C,	NaOH to pH>	12		28 days	
	FIELD SCREENING SUMMARY											
Sampl	e Analysis	-	Method		Date/ Time o	f Analysis	Resu	ılts			Notes	
		1			<del> </del>	-						
<del></del>			<u>-</u>	<del> </del>				•				
					. <u> </u>							
SAMPLER(S	) SIGNATURE	:									ŀ	



SISTICS GF	<u>ROUNDW</u>	AILH SA	FIARE FILAC	LUG						
ielters	SITE LOCAT	ION: Knoxville	, Tennessee	_		DATE:	13/12/12			
	SAMPLE ID:	SMSMW10B	<b>V</b>	<u> </u>		SAMPLE	ITIME: 1022			
L OBSERVATIONS:	Far 1	30'5								
	•									
Pump (and S/N	1): 55 MM	55 Mm soon 2702 Total Well Depth (feet):								
Water Quality I	Weter (and S/N): 431 556 MAPS 620366						Screen Interval (feet)			
						(00-70) Static Depth to Water (feet)				
						29.41				
						Tubing Depth IN ISCIECT				
			1	19-24-7-1	Die	Volume t	o be Purged (gallons): 「ナンルリービー・バイングラント urge Purged (gallons):			
feet) × O ( Co	gallons/foot	= ( , 47	gallons	- Stu	N. Bro	<b>^</b> rotal Vol	ume Purged (gallons):			
me Water	Temp. (°C)	Specific Conductance ms/cm or uS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbid (NTU				
	E COMPANY AND AND AND AND AND AND AND AND AND AND			MATTER WATER STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET, S	THE RESIDENCE OF STREET, AND RESIDENCE.	Charles of Afficial Afficiation in the	CAMPA de la cal campa de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la calenda de la ca			
5 29.30	15.00	1.441	1.82	6.62	204.2	7100				
	15.48	1.599	0.93	6.64	186.4	_50g	<del>/</del>			
		1.621	0.68				ا سکت ال			
				4 40			Ctrast Condi			
	1 .	-		<del>                                     </del>						
	1 2					-				
<del></del>										
- 00-		1.010		<u> </u>	<del>- J-11 (;</del>		700			
		<u> </u>					<u></u>			
Ga!/Ft): 1/8" = 0.000	6; <b>3/16"</b> = 0.0	014; 1/4" = 0	.0026; <b>5/1</b>	1 <b>6</b> " = 0.004;	3/8" = 0.006		<b>6"</b> = 1.47; <b>12"</b> = 5.88 = 0.010; <b>5/8"</b> = 0.016 1 unit; <b>Turbidity</b> : <10 NTU			
Nicate: Vas/ No			MMARY			<del></del> _				
uplicate ID:				_{пе:} 103	0		MS/MSD: Yes/ 😡			
		linimum Sample Volume	e	Preservation			Holding Time			
3 40 mL	. vials	Fill to Capacity		Cool to 4° C;	HCl to pH <2	-	14 days			
1 1 tLH	DPE	1 L	Co	ool to 4 ± 2° C;	HNO ₃ to pH	<2	180 days			
1 1LH	DPE	1 L	Co	ol to 4 ± 2° C;	HNO3 to pH	<2	180 days			
4 1 L Amb	er glass	4 L	:	Cool to	4° C		7 days to extract, 40 days to analyze			
LA ACHI	DPE	1 L	Co	ool to 4 ± 2° C,	NaOH to pH>	12	28 days			
500ML		COREVINO	QI IRANA ADV	,						
	FIELD SCREENING SUMMARY  Date/ Time of Analysis Results				ilts		Notes			
Method										
Method	· · · · · · · · · · · · · · · · · · ·									
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	Turbidity Meter  Water Level In  Al Well Depth - Static I  feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O   C    I feet) X O 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MANAGING THE VISI	MANAGINA THE VISION LENVIRONMENTAL   PACILITIES   LOGISTICS GROUNDWATER SAMPLING LOG													
SITE NAME	: Smokey Mou	ntain Smelters		SITE LOCAT	ION: Knoxville	, Tennessee			DATE: / 2	111/12				
WELL NO:	MWO	TA.		SAMPLE ID:	SMSIN	W70A	SMSMU	107A	SAMPLE TIM	E: MARK				
WEATHER	CONDITIONS/	GENERAL OB	SERVATIONS: (	londy	130		ght B							
<b></b>			<del></del>		PURGING D	1	<del>0</del>							
Well Type:	Flush		Pump (and S/N	): SS Ge	osub 20	D619 (	pump)		Total Well Der					
1	er (inches): 2	. N	Water Quality N	Meter (and S/N):	020	0617- (	controlle	r)	Screen Interva	0 23.0				
1	neter (inches): 3		Turbidity Meter	(and S/N):	451 554	MAS	20805		Static Depth to	Water (feet)				
1		710 - 14		dicator (and S/N	•				1 21	.47				
	orial: TFE						T /		Tubing Depth					
			Depth - Static I				· *	. 2.2	Volume to be	Purged (gallons):				
= (23	feet - 6		×0.16	gallons/foot	= 0.24	galions	×3 - 6	" 7 2	Total Volume	Purged (gallons):				
Time Volume Purged (gal Volume Purged (gal)  Volume Purged (gal)  Volume Purged (gal)  Volume Purged (gal)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Volume Purged (feet)  Vo														
1038 Pump on Son surgerate														
1045 purged a 500 pl into flow that cell. I mered pump to loiten - no water.														
1228 22.49														
21.49														
12/12/12 ~ 21.5														
1340 Started to Peristaltic														
1905 Purged 0,5 gallone started filling bottles. Sin														
		8_		14.14	57.40		7.09		12.6	3 yellow lor				
ļ				 	<del> </del>				ļ	<del> </del>				
<b> </b> -				<u> </u>			<del> </del>			<del> </del>				
<u> </u>								<u></u>						
Tubing Insid	n Criteria Rang	pacity (Gal/Ft) e: Tempera	): 1/8" = 0,000 ture: ± 0.2 °C;	Specific Con	014; <b>1/4</b> " = 0 iductance: <u>+</u> 5%	0.0026; 5/1 6; <b>Dissolv</b>	16" = 0.004; red Oxygen: <u>+</u>	3/8" = 0.000		= 1.47; 12" = 5.88 0; 5/8" = 0.016 ; Turbidity: <10 NTU				
nesueus.	100	PHA OL		s	AMPLING SU	MMARY			<del></del>					
Field Filtered	: (Yed No)	Duplicate: Duplicat	e ID:	·		V _{Tim}	ne: 14	45	MS/M	SD: Yes/				
Samp	le Analysis	Number Contains			inimum Sampl Volume	le	Preser	vation	{	Holding Time				
TCL	Pest/PCBs	1	Z 1 L Ambe	er glass	1×21		Cool to	4° C	7 da	ys to extract, 40 days to analyze				
	·													
, 	·									15 T				
<u></u>								<u> </u>						
		-		FIELD	SCREENING	SUMMARY	,		;					
Samp	le Analysis		Method		Date/ Time		Resi	ults		Notes				
<u> </u>	<u>-</u>				l		<b></b>			<del></del>				
 							<u> </u>							
SAMPLER(S	S) SIGNATURE	:	0 - 0		, 1									
,	SAMPLER(S) SIGNATURE: Incla ryland													



MANAGING THE VIS	HONE ENVIRONMENTAL   F.	ACILITIES   LÓGISTICS	GF	ROUNDW	ATER SA	MPLING	G LOG			<u> </u>			
SITE NAME	SITE NAME: Smokey Mountain Smelters SITE LOCATION: Knoxville, Tennessee DATE: 12/11/1/2												
WELL NO:	MW 6			SAMPLE ID:	SMSM	W073	<del>_</del>	·	SAMPL	E TIME:	+24	<del>2</del> 1555	
WEATHER	CONDITIONS/	GENERAL OB	SERVATIONS:	Undy	1 upp	5 30.5/	Brusy	<u>,                                     </u>					
<del></del>					PURGING I						<u> </u>		
Well Type:			Pump (and S/N	1): 5 <del>5 64</del>	sep pum	4 #1 3e	भार हो	<del>06</del> 191	Total We	eli Depti <b>†0.0</b>			
Well Diamet	ter (inches): 2	',W	Water Quality I	Meter (and S/N)	): ) ac h	Lorded	on ps 4	of	Screen I	Interval 0 - 4			
Tubing Diam	neter (inches): 3	116 × 114	Turbidity Meter	(and S/N):	L	s book.	10 (			epth to \	Water (feet)		
Tubing Mate	erial: PTF	F.	Water Level In				soon 42.	701	Tabing E	Depth M	hidscre	en	
1 WELL VO		<u> </u>	Depth ~ Static I	Depth to Water)	X Well Capacit	19 8-16		table	Volume	to be Pu	urged (gallons	):	
=( 40	feet ~ 2	03.0 feet	× 0.14	gallons/foot	= 2.72	gallons		reen	Total Vo	lume Pu	urged (gallons	5.75	
Time Volume Purged (gal) Volume Purged (gal) Depth to Water (feet) (°C) Temp. (°C) Dissolved Oxygen (mg/L) PH (standard units) ORP (mV) (NTUs) Odor/Color Observation (mg/L)													
1159	Puns or		23.14	14.19	104.3	1.12	5.99	1534	7 100	ט	gravit		
1307	0.25	0.50		14.54	108.7	0.92	5.54	147.9		9710	20 -1	<del>]                                    </del>	
1213	0.45	1.15	23.24	14.59	109.9	0.54	5.94	142.3	,,	•	Start	2	
1217	0.35	1.50	23.28	14.84	109.8	0.52	5.95	139.4				·	
1991	0.35	1.85	23.28	14.75	109.7	0.40	5.97	134.8	98.		• •	<del>-</del>	
1225	<del></del>									7	Cleasing	crane	
	231 0.75 3.00 23.30 14.79 109.2 0.48 5.99 133.9 38.9									41	<u>~</u> ^∦		
1934	0.25	3. 25	23-30	10.74	109.2	0.38	5.98	132.6	15.				
1537	runis on	w/ 551		16.66	108.8 Mid Scre		f-t.	129.8	15.	0	······································		
1845	-5-10	1. 35	23.50	14. 73	109.1	0.44	5.97	139.9	459		Cloud		
1549	6.89	1. 75	23.21	14.44	109.0	0.54	5.99	134.5		0	charm	1512211	
1553		2.00	23.21	14.40	109.1	0.54	6.00	132.7	150		Clear		
Tubing Insid	de Diameter Ca n Criteria Range	e: Tempera	0.75" = 0.02; ): 1/8" = 0.000 ture: ± 0.2 °C;	6; <b>3/16"</b> = 0.0	1.25" = 0.06; 2 0014; 1/4" = 0 nductance: ± 5%	0.0026; <b>5/1</b>	' = 0.37; 4"  6" = 0.004;  ed Oxygen: ±	3/8" = 0.006	" = 1.02; 5; <b>1/2</b> " <b>pH</b> : <u>+</u> 0.	<b>6"</b> = = 0.010 .1 unit;		16	
	A D M	, fhu		9	SAMPLING SU	MMARY							
Field Filtered	1: V96/V9	Duplicate: Duplicat	Yes/No			Tin	ne:			MS/MS	D: (%) No		
	le Analysis	Number	r of Type		Minimum Samp Volume		Preser	vation			Holding Tim	e	
TCL	Pest/PQBs	21	1 L Amb	<del></del>	12		Cool to			7 days	s to extract, 40	days to	
<u> </u>									+		analyze		
<u> </u>	<del></del>	Tol	MSUSC	<del>-</del>	<del>4 tot</del>	<u> </u>			<del></del>				
		_											
								<del></del>	L	· -			
Samp	ie Analysis		Method	FIEL,	D SCREENING  Date/ Time		Res	ulte			Notes		
<u></u>		<del>                                     </del>			-4407 111116	ryoro	1103						
		1	<del></del>						-				
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			<u> </u>		<del></del>							<del></del> -	
SAMPLER(S	S) SIGNATURE	. A	moln	-Ngla	-l								

ASSUCIALES, INC  MANAGING THE VISIGNPE ENVIRONMENTAL & FACILITIES & LOGISTICS  GROUNDWATER SAMPLING LOG												
SITE NAME:	: Smokey Mou	ntain Smelters	<b>.</b>	SITE LOCAT	ION: Knoxviile	, Tennessee			DATE:	17	2112/12	
WELL NO:	MW	08A		SAMPLE ID:	SMSM	A80W1			SAMP	LE TIME	: 1543	
WEATHER (	CONDITIONS/	GENERAL OB	SERVATIONS:	ovesca	st / 30	's / Br	rezvi	7				
					PURGING I		<del></del>					
Well Type:	Flush	)	Pump (and S/N	1):	1 cam	e as we	Cordi	0	Total V	Vell Dept		
Well Diamete	er (inches): 2	u.	Water Quality I	Meter (and S/N)				~	Screen	ı Interval		
Tubing Diam	eter (inches):	di. elim	Turbidity Meter	r (and S/N):	7 th	188,3	ook		Static	25° Depth to	Water (feet)	
			1	dicator (and S/N	\	_ ,,,				26	·00	
Tubing Mater		TF E				<u> </u>	6		PICON	·	m-d screen	
1 WELL VOL	LUME PURGE	= (Total Well	Depth - Static I	Depth to Water)	X Well Capacit	432	Showle p in mil sca	cambles.	Volum	to be P	urged (gallons): 4.3 Z	
= (35	feet – ,	ZC/ feet	× 0.16	gallons/foot	= 1.44	gallons '		·cn	Total \	olume P	urged (gallons): 7.75	
Time	Volume Purged	Total Volume Purged	Depth to Water	Temp.	Specific Conductance fns/cm or	Dissolved Oxygen	pH (standard	ORP (mV)		idity 'Us)	Odor/ Color Observation	
1	(gal	(gal)	(feet)		μS/cm	(mg/L)	units)	(,,,,				
1402	0.25	025	26.04	17.13	7.743	0.92	885	86.2	34	<u> </u>	grange Gionello	
1423	0.50	0.75	26.09	16.50	7.857	1.10	8.83	70.1	311		AIA	
1427	0.50	1.25	24.12	17.42	7.862	0.45	8.84	423	46		AIA	
1439	1.25	2.50	2630	17.46	7.950	0.59	8.84	51.8	9-	15	AIA	
1452	2.50	5.00	24.40	17.83	7.950	0.29	8.83	33.7	99	(	AIA	
1504	Q.50_	\$ 50	26.10	14.22	8.057	0.35	8.85	27.9	710		AA	
1511	0.50	6.00	26.10	17.30	8.149		8.85	73, 5	71000		A/A	
1534	0-50	6.50	26.00	17.21	8.195	0.89	8 87	27.3			A (A	
1541	0-25 0-50	1.25	2400	17.70	8.073	0.77	8.85	24.5	710		AIA	
<del>' ' - '</del> -	<u>(1. 30 </u>	1.6)	200	1. ,0	3.0.7	<i>(1). )</i> (	3.87	C 1 2 -	710		<i>PUP</i>	
						_						
Tubing insid	ty (Gal/Ft):      C le Diameter Ca ı Criterla Rang	pacity (Gal/Ft)	<b>0.75"</b> = 0.02; ): <b>1/8"</b> = 0.000 iture: ± 0.2 °C;	6; <b>3/16"</b> = 0.0	.25" = 0.06; 2 0014; 1/4" = 0 nductance: ± 5%	).0026; <b>5/1</b>	= 0.37; 4"  6" = 0.004;  ed Oxygen: ±	3/8" = 0.006	-,	<b>6"</b> = " = 0.010 0.1 unit;	1.47; 12" = 5.88 0; 5/8" = 0.016 Turbidity: <10 NTU	
			<u> </u>	s	AMPLING SU	MMARY					<u></u>	
Field Filtered Filter Size:	: Yes/No	Duplicate: Duplicat				Tim	ne:_		!	MS/MS	D: Yes/(lo)	
Sampt	e Analysis	Number Contains			/linimum Sampl	le	Preser	vation		_	Holding Time	
TCL F	Pest/POBs	A			#12 L		Cool to	o 4° C	7 days to extract, 40 days analyze			
<del></del> -											<u> </u>	
				FIELD	SCREENING	SUMMARY	,				·	
Sampl	le Analysis		Method		Date/ Time		Res	uits			Notes	
 				-					 			
									<u></u>			
SAMPLER(S) SIGNATURE:												
			Junk	m >	yer						*-	
					()	_					/	



ASSOCIATES, INC.  MANAGING THE VISION I ENVIRONMENTAL ( PACILITIES ) LÓGISTICS  GROUNDWATER SAMPLING LOG												
SITE NAME	: Smokey Mou	ntain Smelters		SITE LOCAT	ION: Knoxville	e, Tennessee			DATE:	121	13/12	
WELL NO:	MW	oyA		SAMPLE ID:	SMSI	MWDYA	1		SAMPLE	E TIME:	0859	
	CONDITIONS/	GENERAL OB	SERVATIONS:	Ciras/	when 2							
					PURGING I							
Well Type:	Flush		Pump (and S/N	1):	Souw	7 601 V	4 con26	20	Total We	ell Depth	(feet):	
Well Diamete	er (inches): 🧲	2.1)	Water Quality I	Meter (and S/N)	: ) 3000	pos y	3 054	1re	Screen I	nterval (i	feet)	
Tubing Diam	eter (inches): $j$	3/16 x 14	Turbidity Meter	r (and S/N):	7	100	1/		Static De	pth to W	Vater (feet)	
Tubing Mater	rial:	E	Water Level In	dicator (and S/N	1): 🔪		· (		Tubing E	epth	41.0	
1 WELL VOL		_	Depth - Static I	Depth to Water)			To		Volume t		rged (gallons): 1, Z	
= ( 43	feet – f	40.5 feet	) × OIL	gallons/foot	=0.4X3	gallons	Stubil	-6	Total Vol	ume Pu	rged (gallons): Z_ 2	
rime Purged Purged (gal (gal) (feet) (°C) (ms/cm pr (mg/L) (mg/L) (mV) (NTUs) Observat											Odor/ Color Observation	
1600		surge -	to purse	Cy Pr	velicos.	water-	Sty) D	WSC T	1/12/	131	2	
<u>0336</u>	Pump	m	1 3		\ <u></u>						13/3/h.A.	
838	3.05	0.25		1608	15.12	2.05	5.93	225.5	710		Work Janes	
0841	0.25	0.50	-	14.92	15.14	1.43	5.90	217.8	7100		A1A	
0852	0.50	1.75		5.89	2183	44	AIA					
0835	35 0.25 2.00 - 17.75 16.50 1.24 588 2180									3	AIA	
08-57	857028 2.25 - 17.97 16.81 1.10 5.88 2178 23									4	A1A	
		<u> </u>	<del></del>	<u> </u>	<del> </del>	<del>  -                                   </del>	! 					
	<del></del>					<del> </del>	<u> </u>					
	- in-											
	uk selada											
Tubing İnsid	ty (Gal/Ft):      C le Diameter Ca Criteria Rango	pacity (Gal/Ft	0.75" ≈ 0.02; ): 1/8" = 0.000 ture: ± 0.2 °C;	1" = 0.04; 1 6; 3/16" = 0.0 Specific Cor		0.0026; <b>5/1</b>	= 0.37; 4" 6" = 0.004; ed Oxygen: <u>+</u>	3/8" = 0.006	' = 1.02; ; <b>1/2</b> " = pH: <u>+</u> 0.	6" ≈ 1 = 0.010; 1 unit;	.47; 12" = 5.88 5/8" = 0.016 Turbidlty: <10 NTU	
Field Filtered	· Vaa/Na	Duntlanta	Var Mo	S	AMPLING SU	MMARY	<del></del>	<u>.</u>				
Filter Size:	165/100	Duplicat		<del>, -</del>		Tim	ie:	- <del></del>		MS/MSD	: Yes/No	
Sampl	e Analysis	Number		e of N niner	Ainimum Sampi Volume	le	Preser	vation	1		Holding Time	
TCL F	Pest/PCBs	A	1 L Ambe	er glass	AC 2		Cool to	o 4° C		7 days	to extract, 40 days to analyze	
		-										
	<del></del>											
				FIELD	SCREENING	SUMMARY						
Sampl	e Analysis		Method		Date/ Time	of Analysis	Res	ults			Votes	
	<del></del>	<del>-                                    </del>			<del></del>			STATE OF THE PERSON NAMED IN COLUMN 1		<u> </u>		
SAMPLER(S	) SIGNATURE	: Lu	ide	1/	٠ بيوسي							



ASSOCIALES, INC.  MANAGING THE VISION TENVIRONMENTAL   PACILITIES   LOGISTICS  GROUNDWATER SAMPLING LOG												
SITE NAME	: Smokey Mou	ntain Smelters		SITE LOCAT	ON: Knoxville	e, Tennessee			DATE:	12	113/2	
WELL NO:	•••	MWO	3 ₁ 3	SAMPLE ID:	SMS	mo	30		SAMPI	LE TIME	: 1115	
WEATHER	CONDITIONS/	GENERAL OB	SERVATIONS:	Sum	1305							
					PURGING I	DATA						
Well Type:	Plust	٦	Pump (and S/N	l):	Soun	ne cas v	e corcle	el			th (feet):	
Well Diamete	er (inches):	2iN	Water Quality N	Meter (and S/N):	on	83	atus		Screen	Interval	(feet)	
Tubing Diam	neter (inches): 3	116 x 4	Turbidity Meter	(and S/N):	4 '	book	dtus		Static [	Depth to	Water (feet)	
Tubing Mate	1/17	_		dicator (and S/N					Tubing	Depth	· 77 <i>C</i> f	
<i>a</i> .			Depth - Static I		/ 12	2,55/	Tostad	بلا_	Volume	to be P	rurged (galions):	
= ( Q Q	) feet -3	7.77_teet	×0.16	gallons/foot	= 4.51	gallons			Total V	olume P	urged (gallons): 13.5	
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance (ms/cm)or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turb (NT		Odor/ Color Observation	
0923	Jump.	M	20 (	August products of parties are an experience of the last time, 24						professional and the second	Liscot	
0931	0.25	0.25	39.43	16.40	1(5.3	1.29	5.53	2000	7100	<u>) ()</u> 교기	L'SBE-SK	
0944	0.25	1.00	40.45	14.40 14.69	114.6	1.01	5 54 5 54	330.3 212.8	76		AIA	
1024	4.00	5.00	52.14	19.15	109.9	6.41	2.69	45.0	460		AIA	
1039	3-25	825	52.95	18.88	1116	6.31	5.86	29.6	21		Light Berg	
1048	1.75	10.00	53.30	18.74	111.7-	0.30	5.55	58.7		-	A/A_	
1055	55 075 1075 51.70				111 %	0.37	5.55	33.7	15	0	A/A	
1103	1.0	11.75	9290	18.95	112.1	0.30	5.54	370	15		MA	
1108	1.25	1300	53.1	18.45	112.8	0.29		41.3	09	_	N/A	
1112	0.55	13.55	53.0	18.03	112.9	0.29	5.53	42.8	100	)	A (/b-	
						<u> </u>	<del>                                     </del>					
Tubing Insid	ty (Gal/Ft): C de Diameter Ca n Criteria Range	pacity (Gal/Ft)	0.75" = 0.02; : 1/8" = 0.000; ture: ±0.2°C;	1" = 0.04; 1 6; 3/16" = 0.0 Specific Con		0.0026; 5/1	' = 0.37; 4"  6" = 0.004; red Oxygen: ±	3/8" = 0.006		<b>6"</b> = ' = 0.010 0.1 unit;	1.47; 12" = 5.88 0; 5/8" = 0.016 Turbidity: <10 NTU	
				S	AMPLING SU	MMARY						
Field Filtered Filter Size:	d: Yes/(No/	Duplicate: Duplicat				Tin	ne:			MS/MS	SD: Yes/No	
Samp	le Analysis	Number Containe			linimum Sampi Volume	le	Preser	vation			Holding Time	
TCL	Pest/PCBs	A'	2 1 L Ambe	er glass	x21		Cool to	o 4° C		7 day	s to extract, 40 days to analyze	
				FIEI C	SCREENING	SUMMARY						
Sampl	FIELD SCREENING SUMMARY  Sample Analysis Method Date/ Time of Analysis Results Notes											
		$\rightarrow$	-									
		$\perp$		J			, e = 1	_				
SAMPLER(S	SAMPLER(S) SIGNATURE:											



HANAGING THE VISIO	DAM ENVIRONMENTAL ) F	ACILITIES   LOGISTICS	GR	OUNDW	ATER SA	MPLING	i LOG			_		
SITE NAME:	Smokey Mou	ntain Smelters	<u> </u>	SITE LOCAT	ION: Knoxviile	, Tennessee	<u> </u>		DATE:	15	113/12	
WELL NO:	NV	JOJA GENERAL OBS		SAMPLE ID:	SMS	SOWN	4		SAMPI	LE TIME:	1349	
WEATHER C	CONDITIONS/	GENERAL OBS	SERVATIONS:		m/ 50	·s/51	wight.	Breez				
<del>'</del> .	PURGING DATA											
Well Type:	Piush		Pump (and S/N	l):	\ Same	as re	cord d		Total V	/ell Dept	h (feet):	
Well Diamete	er (inches): 2	) w	Water Quality N	Meter (and S/N):	. 00	P8 3	of this		Screen	Interval	(feet)	
	_	'	Turbidity Meter	(and S/N):	7	book	<u>.</u> Naggy		Static [	l 7	ーうフ Water (feet)	
	eter (inches): >								•	10.	55	
	ial: PTFC		Water Level Inc	-					Tubing	Depth ,	22	
1 WELL VOL	1 WELL VOLUME PURGE = (Total Well Depth - Static Depth to Water) X Well Capacity  TO Static Volume to be Purged (gallons): 5.01 (1.5 Static Volume Burged (gallons): 7.01 (c. gallons):											
= ( 27 feet 14.5 5 feet) x 0 ( C gallons/foot = 1.4 7 gallons 5.01 Total Volume Purged (gallons): 5.00												
Time	Volume Purged	Total Volume Purged	Depth to Water	Temp. (°C)	Specific Conductance (ns/cm) or	Dissolved Oxygen	pH (standard	ORP (mV)	Turb (NT		Odor/ Color Observation	
152 10 3	(gal	(gal)	(feet)		μS/cm	(mg/L)	units)			***		
1300	150	0.50	16.54	19.51	10.82	0.63	9.80	-57-4	125		L'sht Berse	
1309	0.25	0.75	16.55	19.48	10.68	0.38	9.70	-81.5	131	····	AIA	
1318	1.25	2.00	16.55	19.47	10.59	0.17	9.77	-184.5	5(0.	<del>જ</del>	AIA	
1327	[66.]	3.00_	16.55	19.58	10.40	0.11	9.76	-237.9	<i>3</i> 0	5_	A-A	
1337	1.00	4.00	16.55	19.45	10.62	0.09	9.76	312.7	-	0	AA	
1347	1.00_	5-00	(6.55	19.34	10.62	0.12	9.75	-283. I	7.6	१५	AZA	
				- • • •		and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s						
	_					-						
	- ma			,								
	•											
	e Diameter Ca		<b>0.75"</b> = 0.02; <b>1/8"</b> = 0.0006 ture: <u>+</u> 0.2 °C;			).0026; <b>5/</b> 1	= 0.37; 4" 6" = 0.004; ed Oxygen: ±	3/8" = 0.006			1.47; 12" = 5.88 ; 5/8" = 0.016 Turbidity: <10 NTU	
		_		S	AMPLING SU	MMARY						
Field Filtered: Filter Size:	: Yes/No	Duplicate: Duplicate	Yes/No			Tin	ne:	el .		MS/MS	D: Yes/N	
Sampl	e Analysis	Number Containe			inimum Samp Volume	le	Preser	vation			Holding Time	
TCL F	Pest/PCEs	<i>J</i> .	2 1 L Ambe	er glass	12	L	Cool to	o 4° C		7 day	s to extract, 40 days to analyze	
								· ·				
	•											
FIELD SCREENING SUMMARY												
Sampl	e Analysis		Method		Date/ Time		Res	ults			Notes	
SAMPLER(S	SAMPLER(S) SIGNATURE:											
			K1)	سلا	- JX~	_					·	
			<del></del>		1 }							



	SOCIATES, INC.	FACILITIES   LOGISTICS	GF	ROUNDW	ATER SA	MPLING	G LOG					
SITE NAME:	: Smokey Mou	ntain Smelters	3	SITE LOCA	TION: Knoxville	e, Tennessee			DATE:	12	113 113	2
WELL NO:	Mu	AJOL		SAMPLE ID: SMSMWOLA					SAMPL	E TIME:	1445	)
WEATHER (	CONDITIONS/	GENERAL OB	SERVATIONS:	Sur	my / 50	ງ <b>`</b> ⊊ .			* *			
			· · · · · · · · · · · · · · · · · · ·		PURGING I							
	Flush		Pump (and S/N	<b>1):</b>	Sa	me as	recovel	e.D	Total W	ell Depth	n (feet):	
ľ	er (inches): Z		Water Quality I	Meter (and S/N	1):	r 08.	3 Jr		Screen	Interval ( 30-C		
Tubing Diam	eter (inches):3	1(0×14	Turbidity Meter	(and S/N):	( +	ng bu	record 3 of oK.		Static D	epth to V	Vater (feet)	
Tubing Mate	rial: PTFE	L	Water Level In	dicator (and S/	N): )						35 (M	ud Schee
1 WELL VOL	UME PURGE	= (Total Well	Depth - Static I			ty	1,48					
1 WELL VOLUME PURGE = (Total Well Depth - Static Depth to Water) X Well Capacity   1,48   Volume to be Purged (gallons):   148   To Study   Total Volume Purged (gallons):   Total Volume Purged (gallons):										:		
	Volume	Total Volume	Depth to	Temp.	Specific Conductance	Dissolved	pH	ORP	Touchi	al idea	Odor/ C	ala s
Time	Purged (gal	Purged (gal)	Water (feet)	(°C)	ms/cm <u>or</u> μS/cm	Oxygen (mg/L)	(standard units)	(mV)	Turbi (NTU		Observa	
1407	- John											
1412	0.50	0.50	37.20	17.13	58.42	0.88	6.45	54.5	7100		Light Brown	
1417	0.25	0.75	37.29	17.74	57.59	0.72	6.45	66.5 68.8	7160		A/A	
1428	0.50	1.50	3240	18.54	5710	0.56	6.48 6.46	71.4	242 145			'
1443	1.50	3-00	37.40	18.59	55.81	0.37	Q. 46	71.5	57		AIA AIA	
								-				
								ļ				
Tubing Insid			0.75" = 0.02; ): 1/8" = 0.000 ture: ± 0.2 °C;	6; <b>3/16</b> " = 0.	1.25" = 0.06; 2 0014; 1/4" = 0 inductance: ± 5%	).0026; <b>5/</b> 1	" = 0.37; 4"  6" = 0.004;  ed Oxygen: ±	3/8" = 0.006	" = 1.02; 6; <b>1/2</b> " <b>pH</b> : <u>+</u> 0	6" = 1 = 0.010; .1 unit;		6
Field Filtered	Ves/No	Duplicate:	Ves/ No		SAMPLING SU	MMARY						
Filter Size:		Duplicat	e ID:	, ,		Tin	ne:			MS/MS	D: Yes/ No	-
Sampl	e Analysis	Number Containe			Minimum Samp Volume	le	Preser	vation			Holding Time	•
TCL F	Pest/PCBs	4	Z 1 L Ambe	er glass	ALZL		Cool to	o 4° C		7 days	to extract, 40 analyze	days to
	181				<u> </u>				-			
<u> </u>			<del>-                                    </del>		<u></u>							
FIELD SCREENING SUMMARY												
Sampl	e Analysis		Method		Date/ Time		Res	ults			Notes	
		_								_		
SAMPLER(S) SIGNATURE:												

TE MALE	O	ain Emaltera		SITE I	ATION	l. Knovsille	Tonnoccoo	•		DATE		
	Smokey Mount	ani Sineiters	·	SITE LOCATION: Knoxville, Tennessee								
/ELL NO: /EATHER (	CONDITIONS/ G	ENERAL OB	SERVATIONS:	SAMPL	E ID:				<u></u> .	SAMP	LE TIME	
						NIDOINO E	NATÁ					• .
/ell Type:		<del>-</del>	Pump (and S/I	V):		PURGING E	JAIA			Total \	Vell Dept	
/ell Diamete	r (inchae):	į	Water Quality		Q/NI\+						n Interval	
	•	•					•					. ,
ubing Diam	eter (inches):		Turbidity Meter	r (and S/N)	:					Static	Depth to	Water (feet)
ubing Mate	rial:	İ	Water Level In	dicator (an	d S/N):					Tubing	Depth	
WELL VOI	UME PURGE :	(Total Well	Depth - Static	Depth to W	ater) X	Well Capacit	у			Volum	e to be P	urged (gallons):
(	feet -	feet	) X	gallons/foc	t =		gallons			Total \	/olume P	urged (gallons):
Time	Volume Purged (gal	Total Volume Purged	Depth to Water (feet)	Temį (°C)		Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)		oidity (Us)	Odor/ Color Observation
_		(gal)	<u> </u>		+	<b>дэ/с</b> іп	, , ,	+		<del>  -</del>		
<u> </u>								+		<del> </del>		
			<u> </u>							<del> </del>	-	
				ļ	$\dashv$			<u> </u>		<del> </del>		<u> </u>
<del></del>				<u> </u>	+			<del> </del> -		<del> </del>		
	<u></u> \							†	<del> </del>	<del>                                     </del>		
<del></del> -								<u> </u>		<u> </u>		
			<del></del>					<u> </u>	<u> </u>	<del> </del>		
		.,,			+					<del> </del>		
ıbina Insid	y (Gal/Ft): Cil e Diameter Cap Criteria Range:	acity (Gal/Ft)	1/8" = 0.000	6: <b>3/16</b> "	= 0.0014	4: <b>1/4"</b> = 0	.0026: 5/	" = 0.37; 4" 16" = 0.004; ved Oxygen: <u>+</u>	3/8" = 0.00	5" ≈ 1.02; 96; 1/2 pH: ±		1.47; <b>12"</b> = 5.88 0; <b>5/8"</b> = 0.016 <b>Turbidity</b> ; <10
		1= -2			SAN	IPLING SU	MMARY				<b>,</b>	
eld Filtered ter Size:	: Yes/ No 	Duplicate: Duplicate	e ID:				Tir	me:			MS/MS	SD: Yes/No
Sampl	e Analysis	Number Containe		e of ainer	Min	imum Sampi Volume	е	Preser	vation			Holding Time
TCL F	Pest/PCBs	4	1 L Amb	er glass		4 L		Cool to	0 4° C		7 day	s to extract, 40 day analyze
												<u> </u>
				F	IELD S	CREENING	SUMMAR	1				
Sampl	e Analysis	<u> </u>	Method		$\mp$	Date/ Time of	of Analysis	Res	ults			Notes
	<del></del>					-		<del> </del> -	•	<del> </del>		



## **INSTRUMENT AND CALIBRATION LOG**

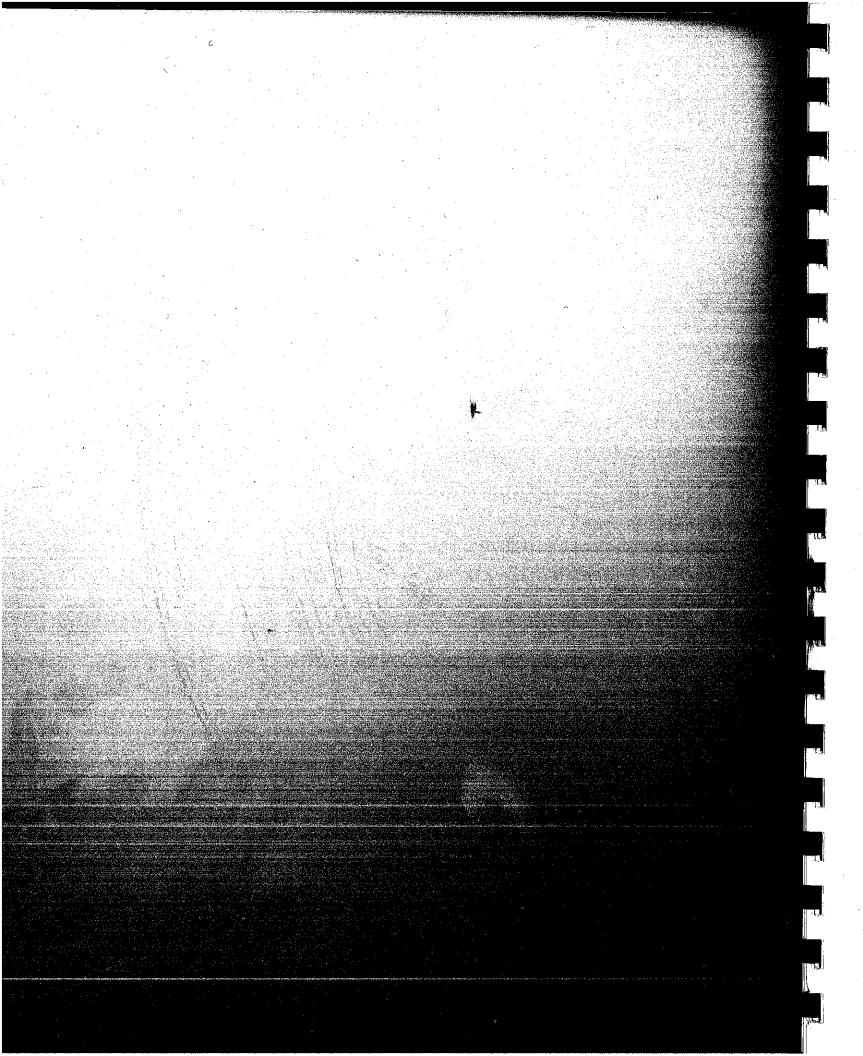
Site Name:

Smokey Mountain Smelter

	Instrur	nent Readir	ngs			Instrument		
Calibration		Calibration	End of Day				Pine #	
Date	Parameter Calibrating	Value	Bump Test	Signature	Туре	Manufacturer	Serial Number	
12/11/12		5 -297.4		1min	world Quality	451 556 MPS	020865	
		2 -2 11.23	;	,				
	Conducting 1.413	<b>-&gt;</b> 1.네3						
	DH4 ) -	4.02	-					
	NH7 7	7.01			-			
		1 + 240	سكف			-		
12/12/12	Done	93.6	***	1mm				
	DOMSIL	1248	_	(				
	cond. 1.549							
<u></u>	DH4	3,89			- 100 mg mg mg mg mg mg mg mg mg mg mg mg mg			
	5H7	7.04					415	
	्र १०	244						
	IOUNTU	101			Tubidity Hach	21991556 MPS	020134	
	20 NTU	20.3			\ \			
	ID NTU.	10.0					الم	
12/13	Down	93.7		Lne	Water Gualian	451556 MPS	020865	
	DUNGIL	11.14		7 7		1		
	Cencl	1.413	***					
	DIM	4.08						
<u>-</u>	DH7	7.00						
-	12P	243.2						
<u></u>	INNT4	101			Trisboda	Hach 2100 Q	020134	
	20174	20.1				/	1	
	TUNTU	10.1						
	(V)-1-(	10.				1		
•		<u></u>			<del></del>	<del> </del>	; .	
L <u>.</u> .	<u> </u>	<u> </u>	ł	<u>.                                    </u>				

	Smaker	Mountain	Smelter	New Ma	nutor W	ells or	nsilo
		dtw (b+	vc) TD	3 Vol	Reco	normales	rsilo vill diaus donor
	MWOIA	<u>d+w(b+</u> ~33	46	6.50		0,5-0.7	5 apm
i i	MW OZA		46'	15g		- 2gpn	<del></del>
	MW 03B	~ 51'	6 k	7,5		9,5 gp	
	MWO4A	~ 35 ?	43'	4.0		0.5 g	
	MWOZA		23′	2.5		0.75-1	
	MWOTB	~ 19.3	40'	10		1-1,5	
	MWOSA	~ 22.1	37,5	8+		0.75	~
	MWIOA	~ 26	32	<b>3</b> g	-	< 0.5	
	MW 10B	~ 23.3	70	24g		1,5	
		QT.	12/12 wederen	I ftwa	tu 3 v	<u>.]</u>	
	MU10 A	32	29.46		0.40		
	OB	70	29.41	40.5 ^			
	2A	27	16.59	•	5. <b>Z</b> g		
	LA_	40	3691	3.1 ~	1.59		
	3.6	66	37.77	28.8'	14,49		
	4A	43	40.85		1.079		
	A8	35	24		4.5g		
					<b>~</b>		G s

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## **SMOKEY MOUNTAIN SMELTERS**

Knoxville, Knox County, Tennessee

June 2013
Field Event 3
Remedial Investigation / Feasibility Study

Groundwater Sampling Log
Book 1 of 2



MANAGING THE VISION® | ENVIRONMENTAL | FACILITIES | LOGISTICS

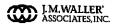
## June 3, 2013 Water level 5

MW-12B	30.29
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## **INSTRUMENT AND CALIBRATION LOG**

MAN Soulles Smokey-Site Name: Instrument Readings Instrument Pre-Post-Calibration Parameter Calibration | Calibration | Calibration Signature Manufacturer Serial Number Date Most Miller augal recorded on ·XRTTHHVK lene Califration Sheet Growelwave XRTTH4VK Horryba US3 6/4/13 Spe Cond 044 377 9.70 NYU 0-00 Water Quality Horbos U 5800 06 05 13 3.97 UCAFREAK Turbidita So Cond DO 23.36 37



PROPERTY I PACIFILIES I CODISTION				
SITE NAME: Smokey Mountain S	melter Site	SITE LOCATION: Knoxville, Tenness	399	DATE: 03JVN/3
WELL NO: MW-12A		SAMPLE ID: MW-(2A		SAMPLE TIME: 1320
WEATHER CONDITIONS/ GENER	RAL OBSERVA	TIONS: Party Charle	1 7051	Breeze
		PURGING DATA		
Well Type: 50//40 PVC	Pump: (S/N)	GUETREN SEMENSIBLE G	50002 (A12)	Total Well Depth (feet):

Well Diameter (inches): Z.6 / D Screen Interval (feet) Water Quality Meter: (S/N): 7/51556 M75 + 12149 (PINF) Turbidity Meter: (S/N): HACH 2100 9 (PINE) 20403
Water Level Indicator: (S/N): //karan DIPPIN-T ANOTHO
(PINE) Static Depth to Water (feet) Tubing Diameter (inches): 3/16/13 3/16ID x 0.25OD √ Tubing Material: Tubing Depth (Begin/End) PTFE (Teflon) Volume to be Purged (gallons): 1 WELL VOLUME PURGE = (Total Well Depth - Static Depth to Water) X Well Capacity gallons/foot feet gallons = ( feet) X

حيها

Total Volume Purged (gallons):

Purge Method: Traditional Multiple Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
1128	0,5	0.5	31,05	1815	2,253	601	5.83	132.1	29.5	NOAM NOW
1145	0.21	0,75	30.96	20.31	7.282	6,16	617	97,0	11.3	
1201	0,15	1	31.02	19,11	ZOSO	6.26	6.08	11576	1,40	
1221	0,2	1.2	31,06	19.31	2,272	5,75	6,08	1271	5,16	
1235	0.2		31.08	20.04	2,262	5.360	6.11	127.2	4,92	
1255	6,1	1.5	37.09	19.64	2,265	5,33	6.12	128 3	•	
13/5	0.3	1,8	21.08	19,41	2,278	5,48	6.15	1270	2.29	<u> </u>
					_					

Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance:  $\pm 5\%$ ; Dissolved Oxygen:  $\pm 0.2 \text{ mg/L}$  or 10% saturation, pH:  $\pm 0.1 \text{ unit}$ ; Turbidity: <10 NTU

#### FIELD SCREENING SUMMARY

Field Filtered: Yes/ No Filter Size: Duplicate: Yes/ No Duplicate ID: Time: MS/MSD: Yes/ No NOTES: (Sample Analysis, Field Screening Analysis, Photograph Information, Rational for Sample Method Used, Well Observations/ Conditions.)

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SAMPLER(S) SIGNATURE:



	SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 3 JUN 13
	WELL NO: SMS MWIDA	SAMPLE ID: SMSMW 10A	SAMPLE TIME: 1550
_	WEATHER CONDITIONS/ GENERAL OBSERVA		

	PURGING DATA	
Well Type: PVC	Pump: (S/N): Geopump.	Total Well Depth (feet): 32 /
Well Diameter (inches): 2	Water Quality Meter: (S/N): Howhar W 5000 HGS # WC 4 FR FAK	Screen Interval (feet) 22-32
Tubing Diameter (inches):	Lurbidity Meter: (S/N):	Static Depth to Water (feet)
3/16ID x 0.25OD Tubing Material:	Water Level Indicator: (S/N): Heron Dipper T	Tubing Depth (Begin/End)
PTFE (Teflon)	12586	~30,5'
1 WELL VOLUME PURGE = (To	otal Well Depth - Static Depth to Water) X Well Capacity feet) X gallons/foot = gallons	Volume to be Purged (gallons):
	Notice Date (100 less formation Text) and our Flore (17 things in Mid Descent)	Total Volume Purged (gallons):

Purge Method: Traditional Multiple Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> <del>µ0/cm</del>	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
1445	0.75	0.75	19.98	26.73	A.58	7.95	4,02	370	0.0	0/0
1450	9.25	1.0	19.98	26,73	4.02	7,95	4.02	370	0,0	010
1455	0.25	1,25	19,95	20.82	5.62	1,22	3.94	411	h m	ela
1500	0.28	1,50	19.97	21.10	5,60	1,24	3.97	416	5.78	00
1505	0.35	1.75	19.97	20,91	5.62	1,28	3,97	419	5,20	0/0
1510	0.25	2.00	12.27	20,89	5.56	1,24	4.02	417	5,20	0/8
1515	0,25	2.25	19,98	20,97	5,48	1,26	4,08	416	6.21	0/2
1520	0.25	7,50	19,98	20.94	5.46	1.28	4,09	417	5,69	010
1525	0.25	2.75	19.98	20.89	5,47	1-30	4.09	419	6.62	ole
1530	0.20	3,00	19,98	20,87	5.43	1.25	4.10	419	6.62	0/0
1535	0.20	3, 30	19.98	20.82	5,44	1.24	4.09	421	10.0	oto
1540	0,20	3,20	12.28	20.84	5,44	1,23	4.07	421	9.44	010
								<u> </u>		

Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 Tubing Inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.016; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance:  $\pm 5\%$ ; Dissolved Oxygen:  $\pm 0.2$  mg/L or 10% saturation, pH:  $\pm 0.1$  unit; Turbidity: <10 NTU

#### FIELD SCREENING SUMMARY

ı	Field Filtered: Yes/No	Filter Size:	Duplicate: Yes N	Duplicate ID:	Time:	MS/MSD: Yes/(No)
١	NOTES: (Sample Anal	ysis, Field Screening	Analysis, Photogra	ph Information, Rationa	l for Sample Method Used, V	Well Observations/ Conditions.)
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SAMPLER(S) SIGNATURE:

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Page 1 of 3

SITE NAME: Sm	okey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 6/4/13
WELL NO:	MWLZB	SAMPLE ID: SMSMW123	SAMPLE TIME:
WEATHER COM	DITIONS/ GENERAL ORSERVA	TIONS:	

PURGING	DATA
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F		T =
Well Type:	Pump: (S/N):	Total Well Depth (feet):
Well Diameter (inches):	Water Quality Meter: (S/N): 3 Same as we corcled as	Screen Interval (feet)
Tubing Diameter (inches):	Turbidity Meter: (S/N): ( $\gamma < 3$ of $\gamma$	Static Depth to Water (feet)
3/16ID x 0.25OD	Turbidity Meter: (5/N): ( $\gamma_5$ 3 of $\gamma_6$	Static Depth to Water (feet)
Tubing Material:		Tubing Depth (Begin/End)
PTFE (Teflon)	Water Level Indicator: (S/N):	, coming Dopan (Dogme End)
PTPE (TellOT)		
1 WELL VOLUME PURGE = (To	otal Well Depth - Static Depth to Water) X Well Capacity	Volume to be Purged (gallons):
= ( feet -	feet) X gallons/foot = gallons	
•	•	Total Volume Purged (gallons):
Purge Method: Traditional Multipl	e Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm-	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
1010	45	2.0	29,93	17.78	3,48	2,20	8,46	170	422	Ø le
1020	1.0	3.0	29,94	17.77	3,47 3.40	2.18	7.99	183	348 503	
1030 1035	1.0	5.0	29.94	17.57	3.31	2.38	7.45	215	480	
1040	1.0	7.0		17.64	3.07	2.09 hidity	7.25	220	413	
1045	Slon 0.6	7.6	29.90	18.06	2.90	1.75	7.19	487-	20 * 4.87	· · · · · · · · · · · · · · · · · · ·
1050	0,5	8.1	29,90 29,89	18,17		1.63	7,19	217	482	
1100	1.0	900	29.89	18,23	2.74 2.74	1.65	7,13	217	430 7400	moved pur

Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

Stabilization Criteria Range: Specific Conductance: ±5%; Dissolved Oxygen: ±0.2 mg/L or 10% saturation, pH: ±0.1 unit; Turbidity: <10 NTU

#### **FIELD SCREENING SUMMARY**

NOTES: (Sample Analysis, Field Screening Analysis, Photograph Information, Rational for Sample Method Used, Well Observations/ Conditions.)

Costumes on Next Page

SAMPLER(S) SIGNATURE:



SAMPLER(S) SIGNATURE:

#### **GROUNDWATER SAMPLING LOG**

Page 2 of 3

SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 4JUN 13
WELL NO: SMSMW 12B	SAMPLE ID: SMS MW 12B	SAMPLE TIME:
WEATHER CONDITIONS/ GENERAL OBSERVA	TIONS:	

	PURGING DATA	
Well Type:	Pump: (S/N):	Total Well Depth (feet):
Well Diameter (inches):	Water Quality Meter: (S/N):	Screen Interval (feet)
Tubing Diameter (inches): 3/16ID x 0.25OD	Turbidity Meter: (S/N):	Static Depth to Water (feet)
Tubing Material: PTFE (Teflon)	Water Level Indicator: (S/N):	Tubing Depth (Begin/End)
1 WELL VOLUME PURGE = (To		Volume to be Purged (gallons):
= ( feet -	feet) X gallons/foot = gallons	Total Volume Purged (gallons):
Purge Method: Traditional Multiple	Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	rotal volume rurged (gallons):

Tìme	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
1115	1.0	11.0	29.94	17.78	2.72	1,64	7.16	272	728	0/0
1120	0.5	11,5	29.90	17.41	2,68	1.47	7,08	215	161_	
1125	0,5	12.0	29.93	17.56	2,60	1,21	6.97	213	60.7	
1130	0,5	12.5	29,90	17,72	2.59	1.16	6,99	209	55,9	
1135	0,5	13.0	29.89	17.82	2,57	1.15	6,99	206	67.8	
1140	0.5	13.5	29.89	17,88	2,56	1.13	6,98	206	90,5	
1145	1,0	145	28.88	18.09	2,55	1,09	6.99	205	96.6	
1150	0.7	15.25	29,88	18.11	255	6.19	6,93	207	139.0	
1205	1.7	17.00	29,88	18,20	7,53	1,13	6.96	301	181,	
1220	2,0	19.0	29,90	18.21	2.50	1,12	6.99	198	134	
72300	2015	20.5	29.90	17,70	2,53	1.15	6.94	197	94,1	
1235	0,50	200	29.90	17.71	2,51	1,11	6,97	195	101	
1240	0,5	21.5	29,90	17.7	2,50	1.08	6,93	197	78.3	

Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU

#### FIELD SCREENING SUMMARY

Field Filtered: Yes/ No	Filter Size:	Duplicate: Yes/ No	Duplicate ID:	Time:	MS/MSD: Yes/No
NOTES: (Sample Analy	sis, Field Screenin	g Analysis, Photograph	Information, Rational f	or Sample Method Used, We	Il Observations/ Conditions.)
Continue	d on h	est page	-tur	be duty still	too high
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			<u></u> _		<u> </u>



SAMPLER(S) SIGNATURE:

Page 3 of 3

VISION ENVIRONMENTAL   PACILITIES   LOGISTICS GROUNDWATER SAMPLING LOG										
SITE NAM	SITE NAME: Smokey Mountain Smelter Site SITE LOCATION: Knoxville, Tennessee 23 DATE: 45UN 2013									
	: SM51		7B 123	SAMPLE II	- 5 M	SMIN	128	<del></del>	SAMPLE TIN	1100
			AL OBSERVA	Oranii Liz ii	<u>,                                    </u>	<u> </u>	4.1	- 4113	)	IE. 1 1 20
PURGING DATA										
Well Type:	Well Type: Pump: (S/N): Total Well Depth (feet):									pth (feet):
Well Diame	eter (inches)	:	Water Qualit	y Meter: (S/N)	):				Screen Interv	al (feet)
_	meter (inche	s):	Turbidity Me	ter: (S/N):					Static Depth	to Wațer (feet)
3/16ID x 0. Tubing Ma PTFE (Tefl	terial:		Water Level	Indicator: (S/I	<b>1)</b> :				Tubing Depth	ı (Begin/End)
1 WELL V	DLUME PUF feet		al Well Depth feet) X		n to Water) X ns/foot =		y gallons			Purged (gallons):
Purge Met	<b>hod:</b> Tradition	onal Multiple	Volume Purge	("Sipping from	n the Top") or l	_ow-Flow ("Tu	bing in Mid S	Screen")	Total Volume	Purged (gallons):
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
1250	1.0	22.5	29,90	18.15	2.49	1.00	6.93	197	67.3	po
1300	1.0	23.5	29.90	18.44	2.45	0.96	6.90	196	73.1	010
1310	0.5	24.0	29,89	18,89	2.43	0,79	6.96	191	68.8	
1320	0.5	24.5	29.89	19.29	2,44	0,77	6,95	189	78,9	
1330	1.5	26,0	29.90	18,43	3.44	0,89	6.97	185	47.8	<u> </u>
1340	1.5	27.5	29,90	17,89	2,46	408	6,94	188	38.3	
11/00	1.5	30.0	29,90 29,90	17.96	2.43 2.45	1.02	6,94	193	34.9 52.9	
1410	1.0	31.0	29,90	17.46	2.44	0,92	6.86	196	21,3	<del></del> ,
1415	10	32,0	29.96	17,58	2.42	0,88	6.84	196	13,3	
1420	1,0	33.0	29.90	17.55	2,41	0.86	6.87	194	10,5	
1428	1.0	34.0	29,20	17.37	2A3	0.91	6.88	195	10,21	
1430	1.0	35.0	29.90	17,38	2,42	0.90	6,89	194	10,1	
Well Capaci Tubing Insid Stabilization	le Diameter C	apacity (Gal/F	t): 1/8" = 0.000	06; <b>3/16</b> " = 0.0	2" = 0.16; 3" = 014; 1/4" = 0.0   Oxygen: <u>+</u> 0.2 r	026; <b>5/16</b> " = 0	0.004; 3/8" = 0	0.006; <b>1/2</b> " =	1.47; <b>12"</b> = 5.88 : 0.010; <b>5/8"</b> = 0. <b>Turbidity</b> : <10 N	016
				FIELD	SCREENING	SUMMAR	Υ			
Field Filter	ed: Yes/No	Filter Siz	e: Dupli	cate: Yes/No	Duplicate	ID:	Time		MS/MSD:	Yes/No
110,20.	-ample Alla	,500, 1 1010 0	o. coming raidi	, s.o, lotogia	p	, . idaoilai ioi			. 54 00001 144101	, 5511411151151
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SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 5 JUN 13
WELL NO: SMS MWOZA	SAMPLEID: SMSMW 02A	SAMPLE TIME: [000
WEATHER CONDITIONS/ GENERAL OBSERVA	ATIONS:	

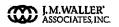
	PURGING DATA	
Well Type: Submers.  Well Diameter (inches): Z  Tubing Diameter (inches): 3/16ID x 0.25OD  Tubing Material:  PTFE (Teflon)	Pump: (S/N):  SS Geo Sub Pump Water Quality Meter: (S/N): U 5000 UC 4 FRFAK Hori Da Turbidity Meter: (S/N): None Water Level Indicator: (S/N):  Heron Dipper 7 26506	Total Well Depth (feet): 27  Screen Interval (feet)  17-27  Static Depth to Water (feet)  14.05  Tubing Depth (Begin/End)  ~ 23
= ( 27 feet - 14	al Well Depth — Static Depth to Water) X Well Capacity (3C) 3 X feet) X 0,163 gallons/foot = gallons 6,5  Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	Volume to be Purged (gallons): Total Volume Purged (gallons):

Time	Volume Purged	Total Volume	Depth to Water	Temp.	Specific Conductance	Dissolved	pH (standard	ORP	Turbidity	Odo	r/ Color
(gal		Purged (gal)	(feet)	(°c)	ms/cm <u>or</u>	Oxygen (mg/L)	units)	(mV)	(aUTV)	Observation	
0910			14,05	17.93	10.8	1.63	9,74	-672	29.0	0/	gray
0915	0,75	1.75	14.05	17,85	10.9	0.86	9.74	-597	23,9	Pl.	40
0920	1,0	2.75	14.05	17.82	10.9	0.48	9.73	-526	26,8	01	l,
0925	1,0	3.75	14.05	17,82	10.9	0.34	9.74	-506	36.8	0/	и
0930	10	4.75	14.05	17.82	110	0.09	9.78	-472	28.6	0/	<u>,u                                    </u>
0935	1.0	5,15	14.05	17.82	16.0	0.00		-470	22.8	9/	4
0940	1,0	6.75	14.05	17,84	11.0	0,00	9,79	-469	20,2	0	brow
0945	1.0	7.15	14.05	17.87	11.0	0.00		-462	14.9	0	clea
0950	2)10,75	8.5	14.05	17.89	11.0	0,00	9,78	-457	11.5	0	<u>/clea</u>
0955	0.75	9,2	14.05	17.94	11.0	0,00	9.78	-461	6.55	Ø	Clea
!											

Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance: ±5%; Dissolved Oxygen: ±0.2 mg/L or 10% saturation, pH: ±0.1 unit; Turbidity: <10 NTU

FIELD SCREENING SUMMARY							
Field Filtered: Yes/No	Filter Size:	Duplicate: Yes	Duplicate ID:	Time:			
NOTES: (Sample Analys	sis, Field Screenin	g Analysis, Photogr	aph Information, Ratio	nal for Sample Method		anditions.)	
Slowed par	mp@0	945 to	help clear	turbidi	ty .		
Mose	E Rosa	ut colling	ected or Sample	purs-	o used 2 on 6/4/13		
·	`						
	NOTES: (Sample Analysis Slowed power	NOTES: (Sample Analysis, Field Screenin	Field Filtered: Yes/NO Filter Size: Duplicate: Yes/NOTES: (Sample Analysis, Field Screening Analysis, Photogram Slowed pamp @ 0945 to  NOTE Rusall Com  NOTE Rusall Com  MWODAR proof to	Field Filtered: Yes/NO Filter Size: Duplicate: Yes/NO Duplicate ID: _ NOTES: (Sample Analysis, Field Screening Analysis, Photograph Information, Ratio Slowed pamp @ 0945 to help clear  NOTE Regard Could deal  NOTE Regard Could deal  NOTES: (Sample Analysis, Field Screening Analysis, Photograph Information, Ratio  Slowed pamp @ 0945 to help clear  NOTES: (Sample Analysis, Field Screening Analysis, Photograph Information, Ratio  Slowed pamp @ 0945 to help clear  NOTES: (Sample Analysis, Field Screening Analysis, Photograph Information, Ratio  Slowed pamp @ 0945 to help clear  NOTES: (Sample Analysis, Field Screening Analysis, Photograph Information, Ratio  Slowed pamp @ 0945 to help clear  NOTES: (Sample Analysis, Field Screening Analysis, Photograph Information, Ratio	Field Filtered: Yes/No) Filter Size: Duplicate: Yes/No) Duplicate ID: Time:  NOTES: (Sample Analysis, Field Screening Analysis, Photograph Information, Rational for Sample Method  Slowed pamp @ 0945 to help clear turbidi  NOTE Rosate Collected or pump  MWOJA proof to Sample purga-		

SAMPLER(S) SIGNATURE:	Ilha		5 Jun 13	
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SITE NAM	SITE NAME: Smokey Mountain Smelter Site SITE LOCATION: Knoxville, Tennessee DATE:									
WELL NO		1		SAMPLE II	):				SAMPLE TIM	
		NS/ GENER	AL OBSERVA		-				<u> 1 Seam EE III</u>	
					PURGING I	DATA			·	
Well Type:			Pump: (S/N):	:					Total Well De	epth (feet):
Well Diame	eter (inches):	\	Water Quality	y Meter: (S/N)	):				Screen Interv	al (feet)
•	meter (inche	s): \	Turbidity Met	ter: (S/N):					Static Depth	to Water (feet)
3/16ID x 0. Tubing Ma PTFE (Teff	terial:		Water Level	Indicator: (S/N	N):				Tubing Depth	ı (Begin/End)
1 WELL V	1 WELL VOLUME PURGE = (Total Well Depth - Static Depth to Water) X Well Capacity = ( feet - feet) X gallons/foot = gallons									Purged (gallons):
Purge Met	hod: Traditio	onal Multiple	Volume Purge	("Sipping fron	n the Top") or I	Low-Flow ("Tu	ubing in Mid S	Screen")	Total Volume	Purged (gallons):
Time	Volume Purged (gal	Total Volume Purged (gal)	Deptrato Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
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Well Capaci Tubing Insid Stabilization	ty (Gal/Ft): le Dlameter C Criteria Rang	0.75" = 0.02 apacity (Gal/F je: Specific C	; 1" = 0.04; t): 1/8" = 0.000 conductance: ± 5	1.25" = 0.06; 06; 3/16" = 0.0 i%; Dissolved	2" = 0.16; 1014; 1/4" = 0.0 1 Oxygen: ± 0.0 r	= 0.37; 4" = 026; 5/16" = 0 ng/L or 10% sat	0.65; 5" = 1 0.004; 3/8" = 0 turation, pH: <u>1</u>	1.02; <b>6</b> " = 0.006; <b>1/2</b> " = <u>+</u> 0.1 unit;	1.47; 12" = 5.88 = 0.010; 5/8" = 0. Turbidity: <10 N	8 016 ITU
				FIELD	SCREENING	SUMMAR	Υ			
Field Filter	ed: Yes/No	Filter Siz	e: Duplic	cate: Yes/ No	Duplicate	ID	Time:		MS/MSD:	Yes/ No
SAMPLER	(S) SIGNAT	URE:		<u> </u>						



INION ENVIRONMENTAL   PACILITIES   LOGISTICS GROUNDWATER SAMPLING LOG											
SITE NAM	E: Smokey	Mountain Sr	nelter Site	SITE LOCA	TION: Knox	ville, Tennes	see		DATE:		
WELL NO	<u>:                                    </u>			SAMPLE II	D:			=	SAMPLE TI	VIE:	
WEATHER	CONDITIO	NS GENER	AL OBSERVA	TIONS:		<u></u>					
	<u></u>				PURGING I	DATA			T		
Well Type:			Pump: (S/N):	:					Total Well Do	epth (feet):	
Well Diame	eter (inches):	\	Water Qualit	y Meter: (S/N)	):				Screen Interval (feet)		
	meter (inche	s):	Turbidity Met	ter: (S/N):					Static Depth	Static Depth to Water (feet)	
3/16ID x 0. Tubing Ma			Water Level	Indicator: (S/f	N):				Tubing Depti	h (Begin/End)	
PTFE (Tef	PTFE (Teflon)										
1 WELL V	OLUME PUF	RGE = (Tota	Well Depth feet) X	- Static Dept	h to Water) X		y gallons		Volume to be	Purged (gallons):	
· ·	= ( feet - feet) X gallons/foot = gallons  Purge Method: Traditional Multiple Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")  Total Volume Purged (gallons):										
Purge Mei		Total	<del></del>	( Sipping noi	Specific			scieen)			
Time	Volume Purged (gal	Volume Purged (gai)	Depth to Water (feet)	Temp. (°C)	Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation	
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Well Capaci Tubing Insid	ty (Gal/Ft): te Diameter Ca	0.75" = 0.02 apacity (Gal/F	1" = 0.04; i): 1/8" = 0.000	1.25" = 0.06; 06; 3/16" = 0.0	2" = 0.16; 3" = 014; 1/4" = 0.0 Oxygen: <u>+</u> 0.2 n	= 0.37; 4" = 026; 5/16" = (	0.65; 5" = 1 0.004; 3/8" = 0	1.02; <b>6"</b> = 0.006; <b>1/2</b> " =	1.47; 12" = 5.88 0.010; 5/8" = 0. Turbidity: <10 N	3 016	
Stabilization	- Citteria riang	e. opeome o	diladolarios. ± 0		SCREENING				Turbidity. < 10 is		
						<u> </u>					
	ed: Yes/No Sample Ana	Filter Siz Iysis, Field S		cate: Yes/ No sis, Photogra			Time: Sample Meth		MS/MSD: Vell Observatio	Yes/ <u>No</u> ns/ Conditions.)	
SAMDIED	SAMPLER(S) SIGNATURE:										
OAWIF LEN	SAMPLER(S) SIGNATURE:										

VISION PENVIRONMENTAL   FACILITIES   LOGISTICS GROUNDWATER SAMPLING LOG										
SITE NAM	E: Smokey	Mountain Sr	nelter Site	SITE LOCA	ATION: Knoxy	/ille, Tennes	see		DATE:	
  _WELL NO:	. \			SAMPLE II	D:		_		SAMPLE TI	ME:
WEATHER	CONDITIO	NS/ GENER	AL OBSERVA	TIONS:						
		_ \ _			PURGING I	DATA				
Well Type:			Pump: (S/N):	:					Total Well De	epth (feet):
Well Diame	eter (inches):	: \	Water Qualit	y Meter: (S/N	):				Screen Inter	/al (feet)
	meter (inche	s): \	Turbidity Mel	ter: (S/N):					Static Depth	to Water (feet)
3/16ID x 0.  Tubing Ma		·	Water Level	Indicator: (S/I	N):				Tubing Depti	n (Begin/End)
PTFE (Teflon)										
1 WELL V	OLUME PUF	RGE = (Tota	al Well Depth	- Static Dept	h to Water) X				Volume to be	Purged (gallons):
= (	feet		felet) X	ŭ	ons/foot =		gallons		Total Volume	Purged (gallons):
Purge Met	nod: Traditio		Volume Purge	("Sipping fror	n the Top") or L	.ow-Flow ("Tu	abing in Mid S	creen")		
Time	Time Volume Purged (gal) (feet) (OC) (specific Conductance ms/cm or ms/cm with ms/cm with ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/									
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Well Capacit Tubing Insid Stabilization	le Diameter C	anacity (Gal/F	; 1" = 0.04; t): 1/8" = 0.000 conductance: <u>+</u> 5	16: 3/16" = 0.0	2" = 0.16 3" = 0014; 1/4 = 0.00 d Oxygen: 40.2 m	0.37; 4" = 026; 5/16" = 0	$0.004 \cdot 3/8" = 0$	006 1/2" =	1.47; 12" = 5.88 :0.010; 5/8" = 0. Turbidity: <10 N	016
				FIELD	SCREENING	SUMMAR	Y			
Field Filtere	ed: Yes/No	Filter Siz	e: Duplie	cate: Yes/No	o Duplicate	 \p:	Time:		MS/MSD:	Yes/ No
SAMPLER(S) SIGNATURE										
SAMPLER	SAMPLER(S) SIGNATURE:									



Water Quality Meter: (S/N):  Tubing Diameter (inches):  Turbidity Meter: (S/N):  Water Level Indicator: (S/N):  Water Level Indicator: (S/N):  WELL VOLUME PURGE = (Total Well Depth - Static Depth to Water) X Well Capacity  (See the set - feet) X gallons/foot = gallons  Purge Method: Traditional Multiple Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")  Volume Total Volume Purged (gallons of Specific Conductance Organ)  Time Purged (Standard ORP)  Turbidity Odor/ Color	SITE NAM	E: Smokey I	Mountain Sr	nelter Site	SITE LOCA	TION: Knox	ville, Tennes	see		DATE:		
PURGING DATA  Purp (SAN):  Vale Type:  Vale Type:  Vale (County Meter (SAN):  Vale County Meter	WELL NO		`		SAMPLE II	):				SAMPLE TIM	ле:	
Veil Type:   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (GaPP):   Veil Capacity (			NS GENER	AL OBSERVA						-I-		
Water Quality Meter: (S/N):  Valing Diameter (inches):  Viriling Diameter (inches):  Viriling Diameter (inches):  Viriling Diameter (inches):  Viriling Diameter (inches):  Viriling Diameter (inches):  Viriling Diameter (inches):  Viriling Abertali:  Viriling Abertali:  Viriling Abertali:  Viriling Abertali:  Viriling Abertali:  Viriling Abertali:  Viriling Diameter (Inches):  Viriling Abertali:  Viriling Diameter (Inches):  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertalii:  Viriling Abertaliii:  Viriling Abertaliii:  Viriling Abertaliiii:  Viriling Abertalii						PURGING I	DATA					
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Walt   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Capacity   Ca	Well Diam	eter (inches):		Water Quality	y Meter: (S/N)	):				Screen Inten	al (feet)	
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VelLCuple PURGE = (Total Well Depth   Static Depth to Water   Static Depth to Water   Static Depth to Well Capacity   Gallons/foot =   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallon				Water Level	Indicator: (S/I	۷):				Tubing Depth	n (Begin/End)	
Time Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal   Purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged (gal purged	PTFE (Tef	on)			•	•					,	
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## **SMOKEY MOUNTAIN SMELTERS**

**Knoxville, Knox County, Tennessee** 

June 2013
Field Event 3
Remedial Investigation / Feasibility Study

Groundwater Sampling Log
Book 2 of 2





1715

## **INSTRUMENT AND CALIBRATION LOG**

Smokey Min Smelters Site Name:

	Inch	ument Re	adinac			Instrument					
Calibration	T	Pre-	Post-	<u> </u>				11150	umem	I	
Date	Parameter Calibrating	Calibration	Calibration	Si	gnature		Туре	Ma	nufacturer_	Seria	al Number
413113	DO mg/L	898	100.0	Ing	<u>l</u>	wates	Quality	451	556 MPS	133	0000
	Do 90	6-29	G-99	"		j	<u> </u>	`			
	404		4.00								
	Spee Cond. 4.49	4.663	4.49							<u></u>	
	Fait	·	6-95								
	DumalL		7.95	fy	μ			Horbo	2 US 3	X RTT	144VK
	Hati		402								•
	Specand.		4.58								
	ONTU		O.00				Andrew Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the			7	1 Fu
6/3/13	рĤ	4.00		Ilh	rha	Wat	en Quality	Ho	iba U5001	\ <del>dC</del> -	FERFA
	no	6.01			10		ř O	·	1		1
	Spec Cond.	4.51									
03JW13	Turb	0.62		7	a		7		1		7
	pit 4	7.0	708	2	ml	Luna	edwy	1/51 5	36 MS	133	100000
	10114		4.15	· V	<u> </u>	1			1	<u> </u>	Ì
	pif10	<del></del>	10.06		1						
	50 CONO 1,412		1.35P			\					
	6RP 240	Y	236.1								
	DO 100 X	1	93,8						<u> </u>		$\mathcal{L}$
83 Jun 13	WESIDIM 20 NN	1	20,1	In 1	1/1	TURSIDI	M	imeif	2100 Q	DINE	Ozofo
6/4/13	Domsk	4-	<del>4</del> .59.	Sil	<del></del>	wade	/ Dulis	451	856	1381	
<b>4</b> , (13)	100 90	95-4		87"	20					1	
	Holt		4.02/4	.20	1		-	j		^	
	TA PH		70199	.08							
	OPP.						a value of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the sta	\			
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	Bonge Zo	N	~ '		1 of 1			1	<del>~ 45</del> 3	<del>XPCT</del>	<del>रिस</del> र्प । 
	Space and			/			\	_ \	بر		

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ASSOCIATES, INC.  EVISIONY ENVIRONMENTAL   FACILITIES   LOGISTICS  GROUNDWATER SAMPLING LOG										
SITE NAM	E: Smokey	Mountain Sn	nelter Site	SITE LOCA	TION: Knox	/ille, Tennes	see		DATE: (4	13/13
WELL NO	Mu	1-13A	Υ		): MW				SAMPLE TI	vie: 1517
WEATHER	CÓNDITIO	NS/ GENER	AL OBSERVA	TIONS: Pa	artly Clo		Breezy	170	2-0	
Mall Types	0, 1		Bump: (S/NI)		PURGING !		<u></u>		Total Well De	anth (foot):
	Plush				bromb				30.9	خ ز
	eter (inches): 2ì ル		Water Qualit	y Meter: (S/N)	1951 55	o puls	<i></i>	2	Screen Inter	
	meter (inche	s):			bach 210				Static Depth	to Water (feet)
Tubing Ma	terial:		Water Level	Indicator: (S/I	v): Hevon	Dppu	TZ	620 A	Tubing Depti	h (Begin/End)
PTFE (Tef						· · · · · · · · · · · · · · · · · · ·			29.	
1 WELL VOLUME PURGE = (Total Well Depth - Static Depth to Water) X Well Capacity    Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column   Column										
			Volume Purge			. , -	bing in Mid S	Screen")		Purged (gallons): - 2・0 のん
Time Volume Purged (gal (gal) Total Volume Purged (gal) Total Volume Purged (gal) Total Volume Purged (gal) Total Volume Purged (gal) Total Volume Purged (feet) Temp. (°C) Specific Conductance ms/cm or provided (conductance										
1254		0.10	20.15	18-76	1.884	821	4.60	147.3	175	Cen ly
1337	0.90	C C	20.77	19.00	1.876	6.20	4.68	200.8	12.2	cleare
1350	0.10	1.10	20.30	19.57	1.884	574	4.69	309.1	7.93	Cleary
1423	0.2	1.7	Za V 2	19.65 21.14	1.87-1	5.23	4.73	21F.7	12.5	
1453	0.07	1.75	21.34	22.20	1.882	5,00	473	231,5	4.36	
1508	6,07	1.3	21.86	21.60	1.917	5.18	4.74	244.6	C23	
						· -	<u>.</u>		<u> </u>	
								!		
					_		<del>-</del>			
				_		<del>-</del>	_			
	de Diameter C	apacity (Gal/F	; 1" = 0.04; t): 1/8" = 0.000 conductance: ± 5	06; <b>3/16</b> " = 0.0	014; <b>1/4"</b> = 0.0	026; <b>5/16</b> " = 0	0.004; 3/8" =	0.006; <b>1/2</b> " =	1.47; 12" = 5.86 0.010; 5/8" = 0 Turbidity: <10 î	.016
	<del></del>			FIELD	SCREENING	SUMMAR	ι <b>Υ</b>			
Field Filter	ed: Yes(No	Filter Siz	e: Dupli	cate: Yes/No	Duplicate	ID:	Time		MS/MSD:	Yes (No
		_				, Rational for	Sample Meth	nod Used, V	Vell Observatio	ons/ Conditions.)
Ba	~CK 8n	nnd u	rel-	Jul	Scan					
Metals + its 1 HN03  SVCS 2 Ambers  Perst  Perss  VOCS 3 VOA  Claricals 2 Poly										
SVOCS Z AMSERS										
Prince										
Trocs 3 voA										
	Clan	cals	7 Pol	ч						
SAMPLER(S) SIGNATURE:										
JAWIPLEH	(S) SIGNAT	UNE	Ju	eli)		<b>λ</b> /\				



ASSOCIATES, INC.  GROUNDWATER SAMPLING LOG  GROUNDWATER SAMPLING LOG											_
SITE NAM	E: Smokey	Mountain Sr	neiter Site	SITE LOCA	ATION: Knox	ville, Tennes	see		DATE:	013113	
WELL NO	: Mw-1	` <i>\R</i>		SAMPLE II	sus	MWI	30		SAMPLE TI	ME: 1651	
			AL OBSERVA		Nostly	Clono	lu 1	80		·····	1
				•	PURGING		1	<u> </u>			_
Well Type:	Prus	h	Pump: (S/N)	GUDSU	to pring d	5 (-500	50 J		Total Well D	epth (feet):	]
	eter (inches)		Water Qualit	v Meter: (S/N	):\ <del>u s (                                  </del>	· · · · · · · · · · · · · · · · · · ·	ed on (	ا 4	Screen Inter	val (feet)	
		<i>y</i> = •			7 95 t as	recorde	don	らし	15	<b>e</b> 4	
Tubing Dia 3/16ID x 0.	imeter (inche .250D	)s):	Turbidity Me	ter: (S/N):	3 of 3	this b	ook '	_	Static Depth	to Water (feet) ・フ <i>역</i>	
Tubing Ma	terial:		Water Level	Indicator: (S/N	V): X 2500	Dead	SIT &	<b>√</b>	Tubing Dept	h (Begin/End)	
PTFE (Teflon)  28 P4											
1 WELL VOLUME PURGE = (Total Well Depth - Static Depth to Water) X Well Capacity  - ( つ 9 9 0 feet - 0 7 2 feet) X 0 ( gallons/foot = 0 6 gallons											
Total Volume Purged (gallons):											
Purge Met	t <b>hod:</b> Traditio		Volume Purge	("Sipping fron		Low-Flow("Ti	Jibing in Mid	screen")	<u>^</u>	7.0 gal	<u> </u>
Time	Volume Purged	Total Volume	Depth to Water	Temp.	Specific Conductance	Dissolved Oxygen	pH (standard	ORP	Turbidity	Odor/ Color	11
Tillie	(gal	Purged (gal)	(feet)	(°C)	ms/cm <u>or</u> μS/cm	(mg/L)	units)	(mV)	(NTUs)	Observation .	
1533	1,5	1.5	25,84	17.66	0.752	0.39	7,00	132.7	123	None/Yaux	4 M CK
1538	1,0	7,5	217.84	17,71	0.735	0,34	7.06	115.7	124	NONE/MILKY	]
KTO	40	3,5	25.86	1757	0.726	0,20	7,05	93.8	87.2	N. NE/MIL	<b>Y</b>
1003	1,0	4,1	21.89	17.42	0,717	0.30	7.05	791	576.2	NON=/MILKY	<b>i</b> l`
1613	1.0	5,5	25.84	17.53	0.722	0.22	701	69.2	39.5	Nonce NONE	₽
1023	lio	65-	21.83	17.45	0.7-23	0.18	7.04	64.7	20,5	None/went	
1634	1,0	7.5	25,56	17.35	O. 72P	0,14	7,05	62.0	14.5	n (1	
1649	1.0	8.5	25.86	17.39	0.751	0.12	7.05	59,2	7,20	4 4	
				,							
err		_			_						
		<u></u>									<b> </b>
					<u> </u>		<u> </u>	<u> </u>	<u> </u>		[[
							<u></u>				<u>Į</u> Į
Well Capaci Tubing Insid	de Diameter C	apacity (Gal/F	t): 1/8" = 0.000	06; <b>3/16</b> " = 0.0	2" = 0.16; 3" = 0014; 1/4" = 0.0 i Oxygen: ± 0.2 r	026; 5/16" = 1	0.004; 3/8" = 0	0.006; <b>1/2</b> " =	0.010; <b>5/8</b> " = 0 <b>Turbidity</b> : <10 f	.016	
	. Sinona ridili	Jo. Opeomo C	-	<del></del>				<u> </u>	Tarbiaity, < 101	****	J
	FIELD SCREENING SUMMARY										

		FIELD 9	CHEENING SUMM	ART	
Field Filtered: Yes/	Filter Size:	Duplicate: Yes/	Duplicate 1D:	Time:	MS/MSD: Yes/ No
NOTES: (Sample Analys	is, Field Screening			for Sample Method Used, We	ell Observations/ Conditions.)
Metals f	H5 ~ (	- 7	vewed/		
Svocs	- 4	Ambers (1	NSWSD)		
Pest	- 4	Ambers	(nsnso)		
PCBS		Ambora	(MSMSD)		
VOCS	9	VUA S	(MSMS)	)	
MNA	7	Doly			
	٤	7			
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SAMPLER(S) SIGNATURE:

Page of 10



MANAGING THE	VISION*) ENVIRONMENTAL   FACILITIES   LOGISTICS	ROUNDWATER SAMPLING LOG	,
	SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 6/4/1)
	WELL NO: MW/ 118	SAMPLE ID: SMS MWILA	SAMPLE TIME: 1612
	WEATHER CONDITIONS/ GENERAL OBSERV	ATIONS: Mostly Samm / Breem / 80	5

<u></u>	PURGING DATA '	
Well Type:	Pump: (S/N): Perostalte Geotech	Total Well Depth (feet):
Well Diameter (inches): 210	Water Quality Meter: (S/N): 451 556 MPS 1381000008	30-3 Screen Interval (feet) 15-30 14
Tubing Diameter (inches): 3/16ID x 0.25OD り	Turbidity Meter: (S/N): HF Scient fre DPT -1566	Janu Depth to water (reet)
Tubing Material: PTFE (Teflon)	Water Level Indicator: (S/N): Iter on Opput T	Tubing Depth (Begin/End)
rire (renon)		-29.30ft
	al Well Depth - Static Depth to Water) X Well Capacity	Volume to be Purged (gallons):
= (30,3 feet -3.58	feet) X ()_)し gallons/foot = リンス gallons	To Stuble
	Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	Total Volume Purged (gallons):

. a. go tuot	alou. Hould	onal maner	rolallio i algo	( Olbbing no.	3010011 )		<u>L</u>				
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation	
1247	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	0.20	378	16.97	16.64	1.25	8.31	-14.0	72.7	Sushty	ľ
1300	0.3	0.50	<i>3</i> ⋅78	16.72	16.11	0.40	8 50	-38.5	22.6	Clean	eun
1310	0.5	1.00	9.78	16.63	15.34	0.35	8.57	-24.0	34.7	Cheed,	+n+   1
1322	0.5	1.50	3.78	17.21	15,17	035	8.59.	13.3	38.0	chu	
1340	0.5	2.00	3.78	17.22	15.45	0.33	8.59	-4.8	40.0	Clievi	
1412	0,75	2.75	3.18	11.55	15.40	0.31	8.59	0.8	48.7	( Least.	-
1430	0.50	3,25	- Gara	17.87	15.33	0.30	8.10	-Z. I	40.1	Clar	
	75.	32	3.71	17.88	15.21	0:30	8,60	-6.6	33, 2	YULLOW TAF	ï
1509	6,3	4.00	3.71	17.85	15.04	0.24	8.60	-9.6	28.2	~ 4	
1528	0.50	4.5	3.71	17.92	14.99	0.23	8.60	-11.3	25.8	7ellow tot	
1345	0,50	5.0	3.41	16.97	15.28	0.31	8.62	~11.3	13.5	yellwhit	
1402	0.15	5.5	3.71	16.98	15.05	0.37	8.04	-7.4	9.48	cleer	1
1609	0.25	5.75	3.71	17.88	14.90	0.22	8.61	-le.i	7.25	Clun	

Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance:  $\pm 5\%$ ; Dissolved Oxygen:  $\pm 0.2$  mg/L or 10% saturation, pH:  $\pm 0.1$  unit; Turbidity: <10 NTU

#### **FIELD SCREENING SUMMARY**

Field Filtered: Yes/ (10) Filter Size: Duplicate: Yes/ (10) Duplicate ID: Time: MS/MSD: Yes/ (10) NOTES: (Sample Analysis, Field Screening Analysis, Photograph Information, Rational for Sample Method Used, Well Observations/ Conditions.) EPALUENT BUBBLY EXPERIEUS IN CONCETTE , W/MICHO PAINT ODER Turnel Metals + Hy Classical S SAMPLER(S) SIGNATURE:



SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 6/4/13
WELL NO: SMSSWSD02	SAMPLE ID: SMS SWOZ	SAMPLE TIME: \$00
WEATHER CONDITIONS/ GENERAL OBSERVA	TIONS: Mosty Sunny / 805	•

	PURGING DATA /	
Well Diameter (inches)	Pump: (S/N):	Total Well Depth (feet):
Well Diameter (inches):	Water Quality Meter: (S/N): Loch C	Screen Interval (feet)
Tubing Diameter (inches):	Turbidity Meter: (S/N): *A (A-	Static Depth to Water (feet)
Tubing Material: PTE (Teflon)	Water Level Indicator: (S/N):	Tubing Depth (Segin/End)
1	al Well Depth - Static Depth to Water) X Well Capacity feet) X gallons/foot = gallons	Volume to be Purged (gallons):
= ( feet - Purge Method: Traditional Multiple	feet) X gallons/foot = gallons  Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	Total Volume Purged (gallons):

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
1455				28.07	4.55	4.91	7.76	113	48.4	
							<u> </u>	<del></del>		
						ļ				
										= 40

Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

Tubing Inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU

#### FIELD SCREENING SUMMARY

Field Filtered: Yes No) Filter Size: Duplicate: Yes Duplicate ID: Time: MS/MSD: Yes NoTES: (Sample Analysis, Field Screening Analysis, Photograph Information, Rational for Sample Method Used, Well Observations/ Conditions.)

See Jocation

Metals

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Voc 5

SAMPLER(S) SIGNATURE: Linde Val Walt Willes



SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 6/5/13							
WELL NO: MWIB	SAMPLEID: SMSMWIB	SAMPLE TIME:							
WEATHER CONDITIONS/ GENERAL OBSERVATIONS: Daving Clarify / 705									

PURGING DATA Well Type: Plush Total Well Depth (feet): Pump: (S/N): same as recorded Screen Interval (feet)

41 - 46 (15 P4)

Static Depth to Water (feet) Well Diameter (inches): Water Quality Meter: (S/N): Turbidity Meter: (S/N): Tubing Diameter (inches): 5.90 3/16ID x 0.25OD Water Level Indicator: (S/N): Tubing Depth (Begin/End) Tubing Material: PTFE (Teflon) w 51.5 Volume to be Purged (gallons):

Total Volume Purged (gallons): 1 WELL VOLUME PURGE = (Total Well Depth - Static Depth to Water) X Well Capacity = ( 569 feet - 5.90 feet)  $\times 0.10$  gallons/foot = 8.10

51-5

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
0854		0.10	6.45	19.09	19.56	7.26	8.33	150.5	244	yellow Int
09/3	0.70	0.50	6-45	19.03	19.50	1.33	8.34	121.9	54,4	
0933	0.50	1.00	-	19.81	19.35	11:4	8.3Y	110.1	19.0	
0954	0.50	1.50		19.18	19.44	6.84	8.33	101.2	5.81	
1010	0.50	2.00		19.47	19.43	6.07	8.33	94.7	2.12	
1036	0.5	2.50		19.18	19.39	1472	8-33	86.4	2.71	
1043_	0.25	2.75		19.34	19.42	0.27	8.33	89.2	2.29	
1056	0.25	300		19.64	19.32	0.25	833	90.Z	4,35	
1109	0.75	3.25		19.84	19.36	0.28	8.33	89.7	287	
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			-							

Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.66; 5" = 1.02; 6" = 1.47; 12" = 5.88 Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance:  $\pm 5\%$ ; Dissolved Oxygen:  $\pm$  0.2 mg/L or 10% saturation, pH:  $\pm$  0.1 unit; Turbidity: <10 NTU

#### FIELD SCREENING SUMMARY

Field Filtered: Yes/ No Filter Size: Duplicate: Yes/ No Duplicate ID: Time: 111 MS/MSD: Yes/ NO NOTES: (Sample Analysis, Field Screening Analysis, Photograph Information, Rational for Sample Method Used, Well Observations/ Conditions.)

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NOTE: Do is high - possible due to flow thron cell-the base would not tighten so noticed our bubbles of 1030 which there call was sitting in a bucket to shade from sun-brocking view of flow then cell.) Placed probe in a culp with water flushing from bottern.

SAMPLER(S) SIGNATURE:



SITE NAM		Mountain Sn			TION: Knox				DATE:		
WELL NO:	\			SAMPLE ID					SAMPLE TIME:		
		NS/ GENER/	AL OBSERVA						1		
	$\overline{}$				PURGING I	DATA			<b></b>		
Well Type:	\		Pump: (S/N):						Total Well De	epth (feet):	
Well Diame	eter (inches):		Water Qualit	y Meter: (S/N)	):				Screen Interval (feet)		
Tubing Dia	meter (inche 2500	s) <u>(</u>	Turbidity Met	ter: (S/N):					Static Depth to Water (feet)		
Tubing Mat	erial:		Water Level	Indicator: (S/f	N):	Tubing Depth (Begin/End)					
= (	OLUME PUF feet	-	feet) X	gailo	h to Water) X ns/foot =		gallons			Purged (gallons):  Purged (gallons):	
Purge Met	hod: Traditio		Volume Purge	("Sipping fron	n the Top") or L	ow-Flow ("Tu	ibing in Mid S	Screen")			
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation	
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Well Capaci Tubing Insid Stabilization	e Diameter Ca	apacity (Gal/Fi	1" = 0.04; t): 1/8" = 0.000 onductance: ± 5	06; 3/16" = 0.0	2" = 0.16; 014; 1/4" = 0.0 I Oxygen: ± 0.2	026; <b>5/16</b> " = 0	0.004; 3/8" = 0	.006; 1/2" =	1.47; 12" = 5.88 : 0.010; 5/8" = 0. Turbidity: <10 N	.016	
				FIELD	SCREENING	S SUMMAR	Y				
	d: Yes/No	Filter Size		cate: Yes/ No			Time:		MS/MSD:		
NOTES. (	- The Aria	iyələ, i idid Ə	Geeting Analy	isis, i libitogra	primorranon	Trailories	Sample Well	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	veli Observalio	ns/ Conditions.)	
SAMPLER	(S) SIGNAT	URE:	<u>.</u>								



ISION* ENVIRONMENTAL   FACILITIES   LOGISTICS	GROUND	MAVIEL	OAIVII I	-1140 E	<u>,                                    </u>		
SITE NAME: Smokey Mountain Si	melter Site SITE LOCA	ATION: Knox	ville, Tennes	50 <u>e</u>		DATE:	
WELL NO:	SAMPLE II	D:				SAMPLE TIN	IE:
WEATHER CONDITIONS/ GENER	AL OBSERVATIONS:				<u> </u>	<u></u> _	
		PURGING I	DATA			<del>,                                     </del>	
Well Type:	Pump: (S/N):					Total Well De	pth (feet):
Well Diameter (inches):	Water Quality Meter: (\$/N)	):	Screen Interval (feet)				
Tubing Diameter (inches): 3/16ID x 0.25OD	Turbidity Meter: (S/N):					Static Depth (	o Water (feet)
Tubing Material: PTFE (Teflon)	Tubing Depth	(Begin/End)					
1 WELL VOLUME PURGE = (Tot = ( feet ~		h to Water) X ons/foot =		y gallons	<del></del> -		Purged (gallons):
Purge Method: Traditional Multiple	Volume Purge ("Sipping fror	n the Top") or l	_ow-Flow ("Τι	ıbing in Mid S	creen")	i otal volume	Purged (gallons):
Time Volume Volume Purged (gal (gal)	Depth to Water (feet) Temp.	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
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Tubing Inside Dlameter Capacity (Gal/F	2; 1" = 0.04; 1.25" = 0.06; ft): 1/8" = 0.0006; 3/16" = 0.0	0.0 = 1/4" = 0.0	026; <b>5/16"\</b> =0	0.004; <b>3/8</b> " = 0	.006; <b>1/2</b> " =	1.47; <b>12"</b> = 5.88 = 0.010; <b>5/8"</b> = 0.0	016
Stabilization Criteria Range: Specific C	Conductance: ± 5%; Dissolved	d Oxygen: ± 0.2 r	ng/L or 10% sat	uration, pH: +	0.1 unit;	Turbidity: <10 N	
	FIELD	SCREENING	SUMMAR	<i>y</i>			<del></del> .
Field Filtered: Yes/ No Filter Siz				Time:		MS/MSD:	
NOTES: (Sample Analysis, Field S	creening Analysis, Photogra	ph Information	, Rational for	Sample Meth	od Used, 1	Well Observation	ns/ Conditions.)
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				<u>.                                    </u>		$\overline{}$	
SAMPLER(S) SIGNATURE:	<u> </u>			<u> </u>			$\overline{}$
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VISION*  ENVIRONME	NTAL   FACILITIES   LO	OGISTICS	<u>u</u>	TOUNL	WAICH	SAWIF	בוואט בל	<u> </u>	1			
SITE NAM	E: Smokey	Mountain Sr	nelter Site	SITE LOCA	ATION: Knox	ville, Tennes	see		DATE:			
WELL NO	<u>.                                    </u>			SAMPLE II	<u>D:</u>				SAMPLE TI	ЛЕ:		
WEATHER	OITIONO	NS/ GENER	AL OBSERVA	TIONS:								
					PURGING I	DATA			<u>, .—</u>			
Well Type:			Pump: (S/N):						Total Well De	epth (feet):		
Well Diameter (inches): Water Quality Meter: (S/N):									Screen Inten	al (feet)		
Tubing Dia	meter (inche	s)\	Turbidity Met	ter: (S/N):					Static Depth to Water (feet)			
Tubing Ma	terial:		Water Level	Indicator: (S/I	N):				Tubing Depth	n (Begin/End)		
					h to Water) X				Volume to be	Purged (gallons):		
= (	feet	1	feet) X	v	ons/foot =		gallons		Total Volume	Purged (gallons):		
Purge Met	hod: Traditio		Volume Purge	("Sipping fror	n the Top") or L	_ow-Flow ("Tu	abing in Mid S	creen")				
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation		
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Well Capaci Tubing inside Stabilization	le Diameter C	apacity (Gal/F	; 1" = 0.04; 1 t): 1/8" = 0.000 conductance: ± 5	06; <b>3/16</b> " = 0.0	2" = 0.14; 3" = 0014; 1/4" = 0.0 d Oxygen: 10.2 r	026; 5/16" = (	0.004; $3/8$ ° = 0	.006; 1/2" =	1.47; 12" = 5.88 0.010; 5/8" = 0. Turbidity: <10 N	016		
				FIELD	SCREENING	SUMMAR	Υ					
	ed: Yes/No	Filter Siz	e: Duplic	cate: Yes/No		<u>                                      </u>	<u>Time:</u>		MS/MSD:			
		.,501								ns/ Conditions.)		
SAMPLER	(S) SIGNAT	URE:										
	(2) 218(17)											



WELL NO: SAMPLE ID: SAMPLE TIME:   WEATHER CONDITIONS/ GENERAL OBSERVATIONS:	allons): allons): Color
Well Type: Well Diameter (Inches): Tubing Diameter (Inches): Tubing Diameter (Inches): Tubing Diameter (Inches): Tubing Diameter (Inches): Tubing Diameter (Inches): Tubing Diameter (Inches): Tubing Diameter (Inches): Tubing Diameter (Inches): Tubing Diameter (Inches): Tubing Diameter (Inches): Tubing Diameter (Inches): Tubing Diameter (Inches): Tubing Diameter (Inches): Tubing Diameter (Inches): Tubing Diameter (Inches): Tubing Diameter (Inches): Tubing Diameter (Inches): Tubing Depth (Begin/Enches): Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Purged (gallons) Total Volume Pur	allons): allons): Color
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Well Diameter (inches):  1/16lib x 0.250D  Tubing Diameter (inches):  3/16lib x 0.250D  Tubing Material:  PTFE (Tellon):  1/16lib x 0.250D  Tubing Material:  PTFE (Tellon):  1/16lib x 0.250D  Tubing Material:  PTFE (Tellon):  1/16lib x 0.250D  Tubing Material:  PURGE = (Total Vell Depth - Siatic Depth to Water) X Well Capacity  eet) X gallons/foot = gallons  Tubing Depth (Begin/End  Tubing Depth (Begin/End  Tubing Depth (Begin/End  Tubing Depth (Begin/End  Tubing Depth (Begin/End  Tubing Depth (Begin/End  Tubing Depth (Begin/End  Tubing Depth (Begin/End  Tubing Depth (Begin/End  Tubing Depth (Begin/End  Tubing Depth (Begin/End  Total Volume to be Purged (gallons  Total Volume Purged (gallons  Total Volume Purged (gallons  Total Volume Purged (gallons  Temp. Conductance  ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm or ms/cm	allons): allons): Color
Tubing Diameter (inches): 3/16ID X 0.250D Tubing Material: PTFE (Tetton)  Water Level Indicator: (S/N):  Water Level Indicator: (S/N):  Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (Begin/End Tubing Depth (	allons): allons): Color
### Walt Capacity (Gal/Ft): 0.75" = 0.02: 1" = 0.04: 1.25" = 0.06: 318" = 0.006: 318" = 0.006: 1.25" = 0.016  ### Walt Capacity (Gal/Ft): 18" = 0.006: 318" = 0.006: 318" = 0.006: 318" = 0.016  ### Walt Capacity (Gal/Ft): 18" = 0.006: 318" = 0.0014: 14" = 0.0026: 518" = 0.006: 128" = 0.016  ### Walt Capacity (Gal/Ft): 18" = 0.006: 318" = 0.0014: 14" = 0.0026: 518" = 0.006: 128" = 0.016  ### Walt Capacity (Gal/Ft): 18" = 0.006: 318" = 0.0014: 14" = 0.0026: 518" = 0.006: 318" = 0.016  ### Walt Capacity (Gal/Ft): 18" = 0.006: 318" = 0.0014: 14" = 0.0026: 518" = 0.006: 318" = 0.016  ### Walt Capacity (Gal/Ft): 18" = 0.006: 318" = 0.016  ### Specific Conductance: ±5%: Dissolved Oxygen: ±0.27mg/L or 10% saturation, pH: ±0.1 unit: Turbidity: <10 NTU  ### Turbidity (Gal/Ft): 18" = 0.006: 318" = 0.016  ### Turbidity: 10" = 0.006: 128" = 0.016  ### Turbidity: 10" = 0.006: 128" = 0.016  ### Turbidity: 10" = 0.006: 128" = 0.016  ### Turbidity: 10" = 0.006: 128" = 0.016  ### Turbidity: 10" = 0.006: 128" = 0.016  ### Turbidity: 10" = 0.006: 128" = 0.016  ### Turbidity: 10" = 0.006: 128" = 0.016  ### Turbidity: 10" NTU  #### Turbidity: 10" NTU  ### Turbidity: 10" NTU  #### Turbidity: 10" NTU  #### Turbidity: 10" NTU  #### Turbidity: 10" NTU  #### Turbidity: 10" NTU  ##### Turbidity: 10" NTU  ###################################	allons): allons): Color
Tubing Material:  PTE (Teflon)  Water Level Indicator: (S/N):  PTE (Teflon)  Water Level Indicator: (S/N):  Water Level Indicator: (S/N):  Tubing Depth (Begin/End Purged (gallors)	allons): allons): Color
Field Filtered: Yes/No Filter Size:   Duplicate: Yes/No   Duplicate: Yes/No   Duplicate: Yes/No   Duplicate: Yes/No   Duplicate: Yes/No   Duplicate: Yes/No   Duplicate: Yes/No   Duplicate: Dubove ("Tubing in Mid Screen")   Total Volume Purged (gallons   Total Volume Purged (gallons   Total Volume Purged (gallons   Total Volume Purged (gallons   Total Volume Purged (gallons   Total Volume Purged (gallons   Total Volume Purged (gallons   Total Volume Purged (gallons   Total Volume Purged (gallons   Total Volume Purged (gallons   Total Volume Purged (gallons   Total Volume Purged (gallons   Total Volume Purged (gallons   Total Volume Purged (gallons   Total Volume Purged (gallons   Total Volume Purged (gallons   Total Volume Purged (gallons   Turbidity   Odor/One   Turbidity   Odor/One   Turbidity   Odor/One   Turbidity   Odor/One   Turbidity   Odor/One   Turbidity   Odor/One   Turbidity   Odor/One   Turbidity   Odor/One   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbidity   Turbid	alions): Color
Purge Method: Traditional Multiple Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")  Time Volume Purged (gal Volume Purged (gal)  Volume Purged (gal)  Volume Purged (gal)  Depth to Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water ("CC)  Water	Color
Time Purged (gal   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Purged (gal)   Pu	
Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 1" = 0.37; 4" = 0.65; 5" = 1.02; 8" = 1.47; 12" = 5.88  Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.016; 5/8" = 0.016  Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 ng/Lor 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU  Field Filtered: Yes/ No Filter Size: Duplicate: Yes/ No	
Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU  FIELD SCREENING SUMMARY  Field Filtered: Yes/ No Filter Size: Duplicate: Yes/ No Duplicate ID: Time: MS/MSD: Yes/ No	
Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU  FIELD SCREENING SUMMARY  Field Filtered: Yes/ No Filter Size: Duplicate: Yes/ No Duplicate ID: Time: MS/MSD: Yes/ No	
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Tubing inside Diameter Capacity (GaVFt): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU  FIELD SCREENING SUMMARY  Field Filtered: Yes/ No Filter Size: Duplicate: Yes/ No Duplicate ID: Time: MS/MSD: Yes/ No	
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Tubing inside Diameter Capacity (GaVFt): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU  FIELD SCREENING SUMMARY  Field Filtered: Yes/ No Filter Size: Duplicate: Yes/ No Duplicate ID: Time: MS/MSD: Yes/ No	
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Tubing inside Diameter Capacity (Gal/Ft): 1/6" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU  FIELD SCREENING SUMMARY  Field Filtered: Yes/ No Filter Size: Duplicate: Yes/ No Duplicate ID: Time: MS/MSD: Yes/ No	
Field Filtered: Yes/ No Filter Size: Duplicate: Yes/ No Duplicate ID: Time: MS/MSD: Yes/ No	
NOTES: (Sample Analysis, Field Screening Analysis, Photograph Information, Rational for Sample Method Used, Well Observations/ Condition	
SAMPLER(S) SIGNATURE:	<del></del>
<u> </u>	



SION'I ENVIRONMEN	ITAL   FACILITIES   L	OGISTICS	G	ROUND	WATER	SAMPI	<u>LING LC</u>	)G			
SITE NAM	E: Smokey	Mountain Sr	nelter Site	SITE LOCA	ATION: Knox	ville, Tennes	S6e		DATE:	· <del></del>	
WELL NO				SAMPLE	D:	-			SAMPLE TIME:		
WEATHER	CONDITIO	NS/ GENER	AL OBSERVA	TIONS:		<b>-</b>					
Mall Tone		\ <del></del>	D (C/N)		PURGING	DATA			T-4-LW-II D-		
Well Type:			Pump: (S/N):	,					Total Well De	eptn (teet):	
Well Diame	eter (inches):	: \	Water Qualit	y Meter: (S/N	):				Screen Interval (feet)		
_	meter (inche	es):	Turbidity Met	ter: (S/N):					Static Depth to Water (feet)		
3/16ID x 0. Tubing Mat PTFE (Teff	erial:		Water Level	Indicator: (S/I	N):				Tubing Depth	(Begin/End)	
1 WELL V	DLUME PUF		Well Depth		h to Water) X		y gallons		Volume to be	Purged (gallons):	
-			1	_	n the Top") or <b>l</b>		•	creen")	Total Volume	Purged (gallons):	
Time	Volume Purged	Total Volume	Depth to Water	Temp.	Specific Conductance	Dissolved Oxygen	pH (standard	ORP	Turbidity	Odor/ Color	
Time	(gal	Purged (gal)	(feet)	(°C)	ms/cm <u>or</u> µS/cm	(mg/L)	units)	(mV)	(NTUs)	Observation	
			$\overline{}$								
	-			<del>\                                    </del>		<u> </u>					
				<del>                                     </del>	<del>-</del>		· -			· <del>-</del>	
						-					
-			_		<del>\</del>						
	<u>-</u>										
										<del>_</del> _	
Well Capach Tubing Insid Stabilization	ly (Gal/Ft): le Diameter C Criteria Rang	0.75" = 0.02 apacity (Gal/Fi je: Specific C	; 1" = 0.04; t): 1/8" = 0.000 conductance: ± 5	1.25" = 0.06; 06; 3/16" = 0.0 0%; Dissolved	2" = 0.16; 3" = 0.014; 1/4" = 0.0 or di Oxygen: ± 0.2 r	= 0.37; <b>4"</b> = 026; <b>5/16"</b> = 0 ng/L or 10% sat	0.65; <b>5</b> " = 1 0.004; <b>3/8</b> " = 0. turation, <b>pH</b> : <u>+</u>	.02; <b>6"</b> = .006; <b>1/2"</b> = .0.1 unit;	1.47; <b>12"</b> = 5.88 = 0.010; <b>5/8"</b> = 0.0 <b>Turbidity</b> : <10 N	016 TU	
<u></u>					SCREENING					<del>-</del> _	
Field Filters	ed: Yes/No	Filter Size	e Dunli	cate: Yes/No		1	Time:		MS/MSD:	Ves/ No	
								od Used, \	Well Observation		
						\	\				
							/	\			
								\			
SAMPLER	(S) SIGNAT	URE:	<del></del>		<del>-</del>		<del></del>		<del>\</del>		
	(-,	<b></b>			_						

## **SMOKEY MOUNTAIN SMELTERS**

**Knoxville, Knox County, Tennessee** 

# August 2013 Quarterly Event 1 Remedial Investigation / Feasibility Study

Groundwater and Surface Water Sampling Log
Book 3 of 3



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MANAGING THE VISION® | ENVIRONMENTAL | FACILITIES | LOGISTICS

J.M.WALLER' ASSOCIATES, INC.	
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Managing the Vision*) En					I AND CALIBR	ATION LOG	DENHWS 2	)	
Site Name:	Smo	Ky My	4. S	melle	ላડ		PFVHWS 3	044	
Sampling Eve			2013	15+ 0+	or of Otry	Sampling			
Instrument/M	eter Mar	ufacturer:			pe of Instrument:	Water quality?	Air Monitor ?		
	Model #	Horibal	J-53		Manufacturer Serial #	* NKMUUFS	Dive to 3	1143.	
[		<del>- 11 </del>	<u> </u>	<del></del>		nt Readings		<u></u>	
Parameter Calibration Date Time Calibrating			Bump reading	Ok to use?	Cignoture	Calibrated Reading	End of Day Bump readings	Initial	
3 (2 4 /13	0900	"TAH	NA	use:	Signature	U 00	U. 6	P36	
1	1	Cond 7-4			1	11-08449	4.42		
4%		NTY				0.0	0.0		
	1	0000				8.83	6.11		
- 1:5		Dongl	-			108.5	83.3	1	
817713	0800	4 pH	NA AU	<b>}</b>	JUMY	4.81	4,53	A-16	
<del> </del>		4,49 cord	<del>                                     </del>		<del>                                     </del>	4,53	4.46	<del>                                     </del>	
		ONTU	<del>  </del>	<b></b> _	<del>}                                    </del>	0.00	9.46 0.0 6.03 m/L B5.2-76 4.73	<del>                                     </del>	
·		Don	<del> </del>	<del>}</del>	<del>} - }</del>		6.03 mg/L		
हां ४६।४	46.44	Bunge	-	<del> </del>	100	400 401	B5.200		
8 38 110	0822	4 14	<del> </del>	<b></b> _	Prise	<u> </u>	7. 73	1-	
}		UNTU	<del></del>	}	<del>}</del>	1.69 0.00	4.85 * 237	<del></del>	
<del> </del>	<del> </del>	סיטמ	<del> </del> -	<del>}</del>	<del> </del>	108-8 100-8	437	<del>                                     </del>	
<del></del>		Domall	<del> </del>	<del> </del>		7:59 7:94	83.0		
amatt 20	77110	ONTU	<del></del>	<del> </del>		- 0 - 2 / - 1 - 1	0.17	<del> </del>	
1	- Pr	IDNIU		<del> </del>	<del> </del>	<del> </del>	10.62	<del> </del>	
ļ ————		1 to the rock	<del> </del>	<del>                                     </del>		<del> </del>	10.00	<del>                                     </del>	
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T.	<b></b> _	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>			
· · · · · · · · · · · · · · · · · · ·	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	
4	used	L Lamotte	2020 W	n fir o	four locky reaching	5			
/-					1 of 1				



NS(ON*) ENVIRONME	SURFACE WATER SAMPLING LOG									
SITE NAM	/E: Smokey		DATE: 8/26/2013							
SAMPLE	1D: SN	SAMPLE TIME: 1605								
Time	Temp.	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolve d Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turkely	Hexav Chror (Must	nlum	Fe (capsule)	
1001	27 72	0.321	9.05	7.62	315	30.5	YES	(b)	Result: 0 W5	
Field Filter	red: Yes/(No	Filter Size:	Dupli	cate: Yes/(vic	Duplicate	ID:	Time	<u> </u>	MS/MSD: Yes/No	
SAMPLE	R(S) SIGNAT	URE: £	مهر	l	··					
T01	al D	· Afge	~ 5.	5 f +	waste	r Qual	hb r	wher	~ 1.5A	
SITE NAM	fE: Smokey	Mountain Sme	Iters	SITE LOCA	TION: Knox	ville, Tennes	see		DATE: 8/26/2013	
SAMPLE	ID: SN	<u>\SSOS1</u>	<u> </u>						SAMPLE TIME: 1020	
<del></del>		Specific								
Time	Temp. (°C)	Conductan ce ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turb dry	Hexav Chror (Must	nium	Fe (capsule)	
1022	26-56	0.285	8.60	7.80	355	44.3	YES	0	Result: OUVS	
Field Filter	Field Filtered: Yes/ No. Filter Size: Duplicate: Yes/ No. Duplicate ID: Time: MS/MSD: Yes/ No.									
SAMPLER(S) SIGNATURE:										
To the Depth - 2.5ft. Water Quality Meter a 1.0ft										

SITE NAM		Mountain Sr		SITE LOCA		DATE: 8/24/13					
Time	Temp.	Specific Conductan ce ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	- Turo chaj	Hexav Chror (Must	nium	Fe (capsule)		
ि हम्ला	27.09		8.29	7.44	307	47.4	YES	<b>©</b>	Range:		
Field Filtered: Yes/NO Duplicate ID: Time: MS								MS/MSD: Yes/ NO			
SAMPLER(S) SIGNATURE:											
To	Total Depth - 2. Water and by Neter a 1.0ft										

HON-   ENVIRONMENTAL   FACILITIES	LOGISTICS	SUR	IFACE V	VATER	SAMPLI	NG LO	<u>G</u>			
SITE NAME: Smokey	Mountain S	meiters	SITE LOCA	TION: Knox	ville, Tennes	see		DATE: 8/24/17	3	
SAMPLE ID:	MSS	05N	14					SAMPLETIME: 131	5	
Time Temp.	Specific Conductan ce ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Tush	Hexav Chron (Must I	nium	Fe (capsule)		
1315 20.2	Ţ <u>.</u>	12	7.44	313	0.0	YES	(NO)	Range : Result: (2) ms/L		
Field Filtered: Yes/No Filter Size: Duplicate: Yes/No Duplicate ID: Time: MS/MSD: Yes/No										
SAMPLER(S) SIGNA	TURE:	$\overline{\mathcal{M}}$				<del></del>				
Flow =	# 7	لكوين	7	)	u /	س-7-س		a 1014 / FCI		
101. distan	4/dan	+-	¥	repair	_			ndtha 6.5ft	-	
•	! <b>}</b>				0.1	15'N	•			
SITE NAME: Smokey	Mountain Sr	nelters	SITE LOCA	TION: Knox	ville, Tenness	see		DATE: 8/24/13		
SAMPLE ID:	125D	1100Z					<del></del>	SAMPLE TIME: 1340	<b>)</b>	
	7.6		<del>,</del>	====	<del>,</del>		====		===	
Time Temp.	Time COC Conductan Coxygen Complete Coxygen Coxygen				TURB	Hexav Chron	nium	Fe (capsule)		
	or μS/cm	(mg/L)	units)	(mV)	- 100	(Must F	Filter)	Range:		
418 21.42	0.447	6.28	7.82	302	89.3	YES	(NO)	Result:		
Field Filtered: Yes/		·	icate: Yes/		<del></del>	Time:		MS/MSD: Yes/ No		
SAMPLER(S) SIGNA		A							<del></del>	
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SAMPLES 5	FORC	ed to i	Render	t Due	TO YE	Luoss	Acke	FTS. NYLAND I	RETUR	
to A Loc	A-770N	<b>~</b> 35′∶	Powwst	MK234	106 7	Puer !	م الحا	Low SACKETS.		
JUBIDITY M	Y BE	ENTRA	ED D.	15 70 F	ample &	S WAL	-KING	IN STREAM T	· Au	
YELLOW JACK	kets.									
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SITE NAME: Smokey	Mountain Sr	nelters	SITE LOCA	TION: Knox	ville, Tenness	SeB	<del></del>	DATE: 012011	5	
SAMPLE ID:	11122	17210	12			<del></del>	<del></del>	SAMPLE TIME: /5 30		
7	Specific Conductan	Dissolved	pH			Hexava	alent		<b>=</b>	
Time Temp.	ce ms/cm	Oxygen (mg/L)	(standard units)	ORP (mV)	Turb	Chrom (Must F	nium	Fe (capsule)		
.cn4 .8	,	<del> </del>	<del> </del>	-2.2)	m, m, t	<del></del>	(NO)	Range:		
1534 21.08	0.1	5.95	7.55	321	8.54	YES	A COLOR	Result:		
Field Filtered: Yes/No	Filter Siz	:e: Dupli	icate: Yes/No	Dupligate	ID:	Time:		MS/MSD: Yes/No		
SAMPLER(S) SIGNA	TURE:	71	1 -		<del></del>	<del></del> ,		<del></del>		
		~V~	<u> </u>	$\sim 4$			<del></del>	<del></del>		
Plows	26.	2 dis	tance (	dan	(5.44)	<b>)</b>				
Depth =		0. 0.	,							
	5.5:1	4	,							
Width =	5.57 5.0 fi	2 drs: N	•			· .	. •			



SURFACE WATER SAMPLING LOG

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SITE NAM	//E: Smokey	Mountain Sm	elters	SITE LO	CATION: K	oxville, Tenn	DATE: 8/24/13			
SAMPLE ID: SASSO SASSWOS SAMPLE ID:									SAMPLE TIME: 1010	
SMSSDSW09										
Time	Temp.	Specific Conductance ms/cm or us/cm		ı (standard	ORP (mV)	Turbidity (NTU)	Flow	/ Rate	Ferrous Iron (Field Test)	
16091	21.43	1.57	5.85	7,45	293	1.40			Range:	
Field Filter	red: Yes/No	MS/MSD: Yes/ NO								
SAMPLER	R(S) SIGNAT	URE:	Λ ₁	<del></del>						
l	10				7.0			<del></del>	<del></del>	
	12.4	distan	u I da	y co	2.34					
	Deput	nt 4.	SIN							
	Mych	N= 3.	,0H							
SITE NAM		Mountain Sm		SITE LOCA	TION: Knox	ville, Tenness	ee		DATE: 812413	
SAMPLE		NSS	BSV	109.	Sprr	1 \			SAMPLE TIME: 1625	
Time	Temp.	Specific Conductance ms/cm or µS/cm	Dissol ved Oxyge n (mg/L)	pH (standard units)	ORP (mV)	tuis	Hexav Chron (Must	nium	Fe (capsule)	
1625	21.65	1.57	7.**	7.70	300	14.7	YES	(N)	Range : Result:	
Field Filter	red: Yes/No	Filter Size	:Dupli	cate: Yes/No	) Duplicate	: ID:	Time		MS/MSD: Yes/ No/	
SAMPLER	R(S) SIGNAT	URE:								
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SITE NAME: Smokey Mountain Smolters SITE LOCATION: Knoxville, Tennessee									DATE: 8127113	
SAMPLE					ý.		SAMPLE TIME:			
Time	Temp.	Specific Conducten ce ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)		Hexav Chron (Müst-	alent nium Ellter)	Fe (capsule)	
							YES	NO	Range :	

Duplicate ID:

Duplicate: Yes/No

Field Filtered: Yes/No

SAMPLER(S) SIGNATURE:

Filter Size:

MS/MSD: Yes/ No

Time:

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ON PHYRIGHMENTAL! FACILITIES | LOGISTICS SURFACE WATER SAMPLING LOG SITE LOCATION: Knoxville, Tennessee SITE NAME: Smokey Mountain Smelters SAMPLE TIME: () & 30 NS 5/15W08 SAMPLE ID: Specific Dissolved рH Conductance ORP **Turbidity** Temp. (standard Flow Rate Time Oxygen Ferrous Iron (Field Test) (°C) ms/cm or (mV) (NTU) units) (mg/L) 20.33 Range: 3،ر 4.79 279 0854 4.56 Result:

Duplicate ID:

Time:

SAMPLER(S) SIGNATURE:

Field Filtered: Yes/ No

Nove- 2 dead crantsh 2 sample location Willth = 8.ft depth = usin.

Duplicate: Yes/ No

Filter Size:

yellow jackets again

Besult:

MS/MSD: Yes/No

SITE NAME: Smokey Mountain Smelters SITE LOCATION: Knoxville, Tennessee CMSSOSWOR-SOM Specific Hexavalent Conductance Temp. ORP Time Oxyge (standard Chromlum Fe (capsule) ms/cm or (mV) units) (Must Filter) μS/cm (mg/L) 1.43 Range: 0925 3.6 148 7.41 9,60 UD 82 YES

MS/MSD: Yes/ No Field Fiftered: Yes/ No Filter Size: Duplicate: Yes/ No Time:

SAMPLER(S) SIGNATURE:

SITE LOCATION: Knoxville, Tennessee SITE NAME: Smokey Mountain Smelters SAMPLE TIME: 10 30 SAMPLE ID:

Time	Temp.	Specific Conductan ce ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	NTU	Hexav Chron (Must	nium	Fe (capsule)
	2016	11/5	70			400	YES	NO	Range:
1034	DQ112	イン	<i>a.</i> 0	Q-70	264	128		NO —	Result:
						SMSSI	JSW90	777	

Field Filtered: Yes/ No Filter Size: Duplicate: Xes/No Time: 1095 | MS/MSD: Yes/(No)

SAMPLER(S) SIGNATURE:

SMSSDSW12 812710 1215 1217 24.05°C 8.03pH 2430RP 245ms/cm 17.3 NYU

Page 4 of 4

1240 23.38°C 7.24 pH 2810 PP 2.23 Ms/cm 17.1 NTY

SMSSDSWOZ - Dry - Steignant probable < ZIN

SMS505W0/ 1330

1331 2256°C 7.73 pH 264 orp 0.555ms/m



SITE NAM	NTAL   FACILITIES   L	OGISTICS		1100112	WATER	OAMILI	TING L	<u> </u>	<del></del>		
	E: Smokey	Mountain S	melter Site	SITE LOCA	ATION: Knox	ville, Tennes	see		DATE	8	128/13
WELL NO	· Mu	<u> 3 03 9</u>	<u>B</u>	SAMPLE II	<u>s: SMS</u>	NWOZ		<del></del>	SAMP	LE TI	WE: 1305
WEATHER	R CONDITIO	NS/ GENER	AL OBSERVA	TIONS:	12y/1to	· · · · · · · · · · · · · · · · · ·	med/	<u>SV:8V</u>	Bro	22	e
144-14-75	<del></del>		T Dummy (8/N)	Ca alsol	PURGING √SSG2		· · · · · · · · · · · · · · · · · · ·		I <del>Taratt</del>		
vveii Type:	Flust		Corresi	112 42	0881 PM	' >105  °4 4 b£	ms cos		lotarv		epth (feet): •
Well Diame	eter (inches)	j	Water Qualit	y Meter: (S/N	): moll	43				Inten	val (feet)
Tubing Dia	ameter (inche		Turbidity Met	ter: (\$/N):	د در حال	Pm Pm	v # 019	296			to Water (feet)
Tubing Diameter (inches):  3/16ID x 0.250D  Tubing Material:  Value (S/N):  A/A  Tubing Material:  Water Level Indicator: (S/N):  Solve (S/N):  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  Static Depth to Water (feet)  A/A  Tubing Diameter (inches):  Static Depth to Water (feet)  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  Static Depth to Water (feet)  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  Static Depth to Water (feet)  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Material:  Water Level Indicator: (S/N):  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Material:  Water Level Indicator: (S/N):  Solve (S/N):  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter (inches):  A/A  Tubing Diameter											
PTFE (Teffon) Solvest Waterland Mexe # 9038/12 mud Scheen											
1 WELL V	OLUME PUF		tal Well Depth feet) X		h to Water) X		y gallons		Volum	e to be	Purged (gallons):
•			Volume Purge	•			ū	Screen")			Purged (gallons):
- urge met	<del> </del>	Total	<del>,                                    </del>	( Cipping nor	Specific		<del> -</del>	Jereen )	u 53	7	Hamette 2e
Time	Volume Purged (gal	Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Conductance ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbi (NTL		Odor/ Color Observation
1003		0.75	33.40	20.57	7100-0	1.69	5.57	152	89<	70	rust color
1017	0.75	1,00	36.55	19.83	99.1	1.29	5.62	72	430	111	2 A/A
1042	1.25	2.25	38.08	20.38 >	<del></del>	0.80	5.61	107	524	127	(1) 1000 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1100	1.25	3-50	37.58	20.91	7,600	0.78	5.62	121	390	166	Cloudy.
1112	0.50	4.00	37.47	21.17	7/00-0	0.63	5.62	134	280	-	.8 Sugar
1152	0.25	5.60	37.01	21.80	7)00 0 1100 0	0.62	5.64	123	154	168 55	8 Eliari
1209	1.00	6.25	37.40	2 74	7 00.C	0.60	5.44	131	818		. · · ·
1229	0-75	7.85	37.58	21.90	7/00.0	7). (13	565	133	540		f. Y
249											
1303	0.75	9.00	37.36	21.85	7100.0	0.55	5.64	145	27.0	9.	47
		<b> </b>	ļ	ļ	ļ				ļ		
ليصصع			<u> </u>		<u> </u>	<u> </u>			<u> </u>		
Well Capaci Tubing Insid	de Diameter C	apacity (Gal/F	2; 1" = 0.04; Ft): 1/8" = 0.000	06: <b>3/16</b> " = 0.0	0014: $1/4$ " = 0.0	026: 5/16" = 0	0.004: 3/8" = 1	1.02; <b>6"</b> = 0.006; <b>1/2"</b> =	0.010; 5	/8" = 0.	.016
Stabilization	Criteria Rang	re: Specific (	Conductance: ± 5	5%; Dissolved	d Oxygen: ± 0,2 i	ng/L or 10% sat	turation, <b>pH</b> :	<u>+</u> 0.1 unit;	Turbidity	r: <10 N	VTU
	<del></del> -	<del></del>	<del></del>	FIELD	SCREENING	SUMMAR	Y		<del></del>		
	ed: Yes/No		ze: Dupli	cate: Yes/ N	Duplicate	ID:	Time				Yes/No
			ze: Dupli	cate: Yes/1	Duplicate	ID:	Time				Yes/160 ns/ Conditions.)
	, , , , , , , , ,										
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	J.M.WALLER' ASSOCIATES, INC.
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Purge Method: Traditional Multiple Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")  Total Volume Purged Volume Purged (gall (gal) Volume Purged (feet) ("C) ("C) ("C) ("C) ("C) ("C) ("C) ("C	OITE MARK	NTAL   FACILITIES   L	OGISTICS		HOOME	WATER	JAIVIF	LING L	JG	<del>, -</del>	-0/	-
PURGING DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Purging DATA  Pu	SIIE NAM	IE: Smokey	<u>Mountain Si</u>	melter Site	SITE LOCA					DAT	<u>E: と/</u>	28/13
PURGING DATA  PURGING DATA  Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pump: (SN): Pu	WELL NO	M	NIIA	<i></i>	SAMPLE	<u> </u>	JWW1	1/+		SAN	IPLE TIN	ME: 1513
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Well Diameter (inches): 7 N Tubing Diameter (inches): 7 Tubing Diameter (inches): 8/16 D X Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N): 15 Sample Conduction (S/N)	·									,		<del></del>
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Twell Volume   Get -   Static Depth to Water)   Well Capacity   Gallons   Static Depth to Water)   Well Capacity   Gallons   Static Depth to Water)   Static Depth to Water   Static Depth to Water   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   G	Tubing Dia	ımeter (inche	es):	Turbidity Me	ter: (S/N):	7 321	PSIA	d Aate	~ <b>~ ~</b>	Stat		
Twell Volume   Get -   Static Depth to Water)   Well Capacity   Gallons   Static Depth to Water)   Well Capacity   Gallons   Static Depth to Water)   Static Depth to Water   Static Depth to Water   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   G				Water Level	Indicator: (S/	un. \ 600	rsk //	) 4002	1 مه	Tubi		
Twell Volume   Get -   Static Depth to Water)   Well Capacity   Gallons   Static Depth to Water)   Well Capacity   Gallons   Static Depth to Water)   Static Depth to Water   Static Depth to Water   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   Gallons/foot   G				Water Eever	maioaton (on		ceton.	v. sary	a* 135			
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Y24	Time	Purged	Volume Purged	Water	Temp. (°C)	Conductance ms/cm or	Oxygen	(standard		(N	TUs)	Observation
Y   S   1-50   1-75   5-98   21-94   12-7   2.07   9.09   74   118   27-7   55   144   155   150   1.75   1.25   5.98   22-23   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.2   2.	424	0.25	1 - 12 - 1	5.93	22.48	<del>  - '</del> -	1.06	9.60	93	<del>                                     </del>		
Y48   1.25   3.06   5.78   23.09   (3.4   (.55   9.09   70   75.   24.2   500   1.25   4.25   5.98   32.23   3.2   0.58   9.11   6.3   51   13.1   510   1.25   5.90   5.98   32.23   1.9   0.73   9.11   6.5   50   7.29   1.25   5.90   5.98   32.23   1.9   0.73   9.11   6.5   50   7.29   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25   1.25				598				9.09		$\overline{}$	27.7	Sharac
Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88  Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/6" = 0.006; 1/2" = 0.016  Stabilization Criteria Range: Specific Conductance: ±5%; Dissolved Oxygen: ±0.2 mg/L or 10% saturation, pH: ±0.1 unit; Turbidity: <10 NTU  FIELD SCREENING SUMMARY  Field Filtered: Yes (No) Filter Size: Duplicate: Yes/No) Duplicate ID: Time: MS/MSD: Yes (No)					<del>,</del> _	12.4		<del> </del>		95.	24.2	
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Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance: ±5%; Dissolved Oxygen: ±0.2 mg/L or 10% saturation, pH: ±0.1 unit; Turbidity: <10 NTU  FIELD SCREENING SUMMARY  Field Filtered: Yes/No Filter Size: Duplicate: Yes/No Duplicate ID: Time: MS/MSD: Yes/No		L	<b></b>	<del> </del>	<del> </del>	<del></del>	ļ	ļ	ļ. <u>.                                   </u>	<b> </b>		 <del> </del>
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Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance: ±5%; Dissolved Oxygen: ±0.2 mg/L or 10% saturation, pH: ±0.1 unit; Turbidity: <10 NTU  FIELD SCREENING SUMMARY  Field Filtered: Yes/No Filter Size: Duplicate: Yes/No Duplicate ID: Time: MS/MSD: Yes/No												
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Field Filtered: Yes/No Filter Size: Duplicate: Yes/No Duplicate ID: Time: MS/MSD: Yes/No	Tubing insid	de Diameter C	apacity (Gal/F	t): 1/8" = 0.00	06; <b>3/16"</b> = 0.0 5%; <b>Dissolve</b>	0014; 1/4" = 0.0 d Oxygen: ± 0.2	1026; <b>5/16</b> " = 1 mg/L or 10% sa	0.004; 3/8" = turation, pH:	0.006; 1/2" =	= 0.010;	5/8" = 0.	016
				<del></del>	FIELD	SCREENING	GSUMMAR			<del></del>		
					unia Bhatagra	be information				WEN OL	1201 AUTÓ	ris/ Condiditions.)
					ysis, Photogra	iph Information	ı, Rational for	Sample Met	100 USBQ, V			
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Page 2 of 7

## **SMOKEY MOUNTAIN SMELTERS**

Knoxville, Knox County, Tennessee

August 2013

Quarterly Event 1

Remedial Investigation / Feasibility Study

Groundwater Sampling Log
Book 1 of 3





## **INSTRUMENT AND CALIBRATION LOG**

Site Name:		· .						
Sampling Eve	ent:	·						
Instrument/M	eter Mar	nufacturer:		Ту	pe of Instrument:	Water quality ?	Air Monitor ?	
	Model #	Homba	U5060		Manufacturer Serial	# PINE OZO SAY		_
<u> </u>			<u> </u>			nt Readings		
Calibration Date	Time	Parameter Calibrating	Bump reading	Ok to use?	Signature	Calibrated Reading	End of Day Bump readings	Initial
8-16-13	10:35	PH44			STANS	4,0	4.04	ALB
	1	CONS			, , ,	41264.49	4.36	PSP
		DO				1060%	106%	As7
L		TURIS			<u> </u>	8	7.30	ASC
8/27/13	0802	144			A Gammet	3.19	3.99	Asc
1		COND			1	4.56	10.7	
		D=			<u>'</u>	102.2	101.0	$\bot$
	<u> </u>	TURB			J.	0.00	0,0	سلا
			<u> </u>					
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C 12:2	In the		<u> </u>			1, , , ,	(1 2 7	1047
8-21-13	10102	ph	<u>                                     </u>		>/hengsen	4,01	4.37	ASG
_		msem				0,0	3.5	1-1-
		NTU	<del> </del>	<del>                                     </del>		9.53 9.53	7.59	++-
		9.65 DC	<del>' </del>	1		1,00	<del>  127                                   </del>	+-
							<del>                                     </del>	+
·	+	-			<u> </u>			,
			+		<u> </u>	-		+
	1	<del> </del>	<del> </del>	<del> </del>				+
	<del>                                      </del>	+		<del> </del>	<del> </del>			1

SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 3/27/13									
WELL NO: SMSMW 12A	SAMPLE ID: SAS AW 12A	SAMPLE TIME: 1558									
	WEATHER CONDITIONS/ GENERAL ORSERVATIONS:										

	PURGING DATA	
Well Type: Pvc	Pump: (S/N): BLADDER	Total Well Depth (feet):
Well Diameter (inches): 2	Water Quality Meter: (S/N): HONBA U5000 U53	Screen Interval (feet)
Tubing Diameter (inches): 3/16ID x 0.25OD	Turbidity Meter: (S/N): LAMOTTE 2020 UE	Static Depth to Water (feet)
Tubing Material:	Water Level Indicator: (S/N):	Tubing Depth (Begin/End)
PTFE (Teflon)	SILINEST	-36.0
1 WELL VOLUME PURGE = (Tot	al Well Depth - Static Depth to Water) X Well Capacity	Volume to be Purged (gallons):
≈ ( feet –	feet) X gallons/foot = gallons	1

Total Volume Purged (gallons):

Purge Met	hod: Traditio	onal Multiple	Volume Purge	("Sipping fron	n the Top") or L	_ow-Flow ("Tu	bing in Mid S	Screen")	Total volume	Purgeo (gallons):
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
1114	0.25	0.25	33.51	21.60	5.30	3.00	6.62	165	21.8	
1423	6.25	0.5	33.80	20.57	4.73	2.21	6.53	167	11.2	
1437	0.5	1,0	34.75	18:38	4.74	[.]]	6.45	167	21.5	
1451	05	1.5	34.56	10.56	4.80	0.98	6.43	166	23.6	
1516	0.5	20	31.49	20.49	5.02	1.11	6.51	152	20,2	
1542	0.5	2.5	34.40	21.81	5.16	1.11	6.57	147	10.7	
1554	0.25	2:75	34.75	21.74	5.22	1.19	6.58	148	5.58	
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Well Capacity (Gal/Ft):  $0.75^\circ = 0.02$ ; 1'' = 0.04; 1.25'' = 0.06; 2'' = 0.16; 3'' = 0.37; 4'' = 0.65; 5'' = 1.02; 6'' = 1.47; 12'' = 5.88 Tubing inside Diameter Capacity (Gal/Ft): 1/8'' = 0.0006; 3/16'' = 0.0014; 1/4'' = 0.0026; 5/16'' = 0.004; 3/8'' = 0.006; 1/2'' = 0.016; 5/8'' = 0.016 Stabilization Criteria Range: Specific Conductance:  $\pm 5\%$ ; Dissolved Oxygen:  $\pm 0.2$  mg/L, or 10% saturation, pH:  $\pm 0.1$  unit; Turbidity: <10 NTU

ĺ	Field Filtered: Yes/ No	Filter Size:	Duplicate: Yes/No	Duplicate ID:	Time:	MS/MSD: Yes/ No	
	, , ,	· · · _	• • • •		or Sample Method Use	d, Well Observations/ Conditions.)	
	THIS PARE	E SKIPI	ed in e	error.			
	SAMPLE	Couer	FD 8/27	AFTER	PAGÉ -	1 087.	
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i							

SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 8/26/13							
WELL NO: SAS MU 13B	SAMPLE ID: SMS MW 13 B	SAMPLE TIME: 1132							
WEATHER CONDITIONS GENERAL OBSERVATIONS: WARM, TOMES									

**PURGING DATA** Well Type: 🗸 🕻 Pump: (S/N): GEG SUB Total Well Depth (feet): 7 Water Quality Meter: (S/N): 20337 H-R.6A Well Diameter (inches): 2 ** Screen Interval (feet) C 2000 Static Depth to Water (feet) Tubing Diameter (inches): Turbidity Meter: (S/N): 31.71 3/16ID x 0.25OD Water Level Indicator: (S/N): Sacras T 903812 Tubing Depth (Begin/End) Tubing Material: PTFE (Teflon) 64.0' 1 WELL VOLUME PURGE = (Total Well Depth - Static Depth to Water) X Well Capacity Volume to be Purged (gallons):

= ( feet - feet) X gallons/foot = gallons

Total Volume Purged (gallons):

Purge Method: Traditional Multiple Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
10.54	1.25	0.25	21.7/	24.84	0.003	8,5	4.62	253		CLEAR
1106	1.00	1.25	32.15	17.71	0.662	761	6.72	579	129	حرين و بالا
111	0.75	7.00	32.10		0.670	500	6.67	79	28.6	CLEAR
111/2	075	275	31/4	17.98	.681	4119	662	94	14.5	LICAR
1125	5.75	3.50	32.13	18.06	0 683	3.66	6.60	60	0.33	CLEAR
1129	0.25	3.75	32.06	1827	6.683	34 <u>7</u>	6.62	10	7.56	CLEMK
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								<u> </u>		
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Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 Tubing Inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU

#### FIELD SCREENING SUMMARY

Field Filtered: Yes/ No Filter Size: Duplicate: Yes/ No Duplicate ID: Time: MS/MSD: Yes/ No NOTES: (Sample Analysis, Field Screening Analysis, Photograph Information, Rational for Sample Method Used, Well Observations/ Conditions.)





## **GROUNDWATER SAMPLING LOG**

SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxviile, Tennessee	DATE: 8/26/13							
WELL NO: SMS MW 13 A	SAMPLE ID: SM SM W 13#	SAMPLE TIME:							
WEATHER CONDITIONS/ GENERAL OBSERVATIONS:									

	PURGING DATA	· · · · · · · · · · · · · · · · · · ·
Well Type: PIC	Pump: (S/N): 660 50 B. 20881	Total Well Depth (feet): 38
Well Diameter (inches): 2**	Screen Interval (feet) 15-30	
Tubing Diameter (inches): 3/16ID x 0.25OD	Static Depth to Water (feet)	
Tubing Material: PTFE (Teflon)	Tubing Depth (Begin/End)	
1 WELL VOLUME PURGE = (To	Volume to be Purged (gallons):	
Purge Method: Traditional Multiple	Total Volume Purged (gallons):	
Volume Total	Depth to Specific Dissolved pH ODD	7

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp.	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
255	0.25	6,25	>28.75	21.80	1.66	5.11	5.24	298	502	BROWN
306	0.50	0.75	128.25	22.90	1.82	4.48	4.82	343	386	BROWN
1315	P	URGET	De	(					·	
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			<u>,</u>	<u> </u>					<u> </u>	1.2
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Well Capacity (Gal/Ft): 0.75'' = 0.02; 1'' = 0.04; 1.25'' = 0.06; 2'' = 0.16; 3'' = 0.37; 4'' = 0.65; 5'' = 1.02; 6'' = 1.47; 12'' = 5.88 Tubing Inside Diameter Capacity (Gal/Ft): 1/8'' = 0.0006; 3/16'' = 0.0014; 1/4'' = 0.0026; 5/16'' = 0.004; 3/8'' = 0.006; 1/2'' = 0.010; 5/8'' = 0.016 Stabilization Criteria Range: Specific Conductance:  $\pm 5\%$ ; Dissolved Oxygen:  $\pm 0.2$  mg/L or 10% saturation, pH:  $\pm 0.1$  unit; Turbidity: <10 NTU

Field Filtered: Yes/ No	Filter Size:	Duplicate: Yes/No	Duplicate ID:	Time:	MS/MSD: Yes/ No
NOTES: (Sample Analy	sis, Field Screening	Analysis, Photograp	h Information, Rational f	or Sample Method Used, V	Vell Observations/ Conditions.)
ALMOST	NO WAT	TER IN U	iek. Veny	Low From 1	MAINTHINED.
Punped	Day a	T 1308	<i>•</i>		
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a garage					



**GROUNDWATER SAMPLING LOG** 

SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 6/26/13						
WELL NO: SMS MUEZA	SAMPLE ID: SMS MW OZA	SAMPLE TIME: / 4Z						
WEATHER CONDITIONS/ GENERAL OBSERVATIONS:								

	PURGING DATA	
Well Type: PVC	Pump: (S/N): PER STAUTIC PINE 19553	Total Well Depth (feet):
Well Diameter (inches): 2 "	Water Quality Meter: (S/N): Horish USODO	Screen Interval (feet)
Tubing Diameter (inches): 3/16ID x 0.25OD	Turbidity Meter: (S/N):	Static Depth to Water (feet)
Tubing Material: PTFE (Teflon)	Water Level Indicator: (S/N): Soci N 57	Tubing Depth (Begin/End)
1 WELL VOLUME PURGE = (Tot = ( feet -	al Well Depth - Static Depth to Water) X Well Capacity feet) X gallons/foot = gallons	Volume to be Purged (gallons):
Purge Method: Traditional Multiple	Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	Total Volume Purged (gallons):

Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
0.25	0.25	14.96	29.72	9.60	1.43	9.87	-161	653	RED/RUST
0.5	0.75	14.98	25.52	10.1	069	9.77	-185	570	RUST.
0.75	1.50	14.93	24,26	10.5	0.43	9.72	-201	481	RUST
0.75	2.25	H.9B	21.29	11.1	0.68	9.72	-209	412	
0.8	2.75	14.97	21.99	II.I	0.63	9.70	-203	367	
2225		Cie	MARO	PRO	BÉ	•			
077	325	H.97	22.36	11.0	6.68	9.72	-188	65.4	
11.5	3.75	14.77	22.25	11.0	0.36	9.71	-204	54.1	
0.75	4.5	14.96	22.54	11.>	0.37	9.71	-202	47.4	
0.5	5.0	14.96	22.58	11.3	0.33	9.72	-202	41.3	
0.5	5.5		22.55	11,5	0.34	9.73	-703	41.5	
	]				<u> </u>			39.6	
							. — ————		
	Purged (gal 0.25 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.	Volume Purged (gal)  0.25 0.25  0.5 0.75  0.75 /.50  0.75 2.25  0.5 2.75  2.75  0.5 3.75  0.15 4.5  0.5 5.0	Volume Purged (gal)  0.25 0.25 14.96  0.5 0.75 14.98  0.75 1.50 14.98  0.75 2.25 H.98  0.75 2.75 14.97  0.5 3.75 14.77  0.14 4.5 14.96  0.5 5.0 14.96	Volume Purged (gal)  0.25 0.25 14.96 29.72  0.5 0.75 14.98 25.52  0.75 1.50 14.98 25.52  0.75 2.25 N.9B 21.29  0.5 2.75 14.97 21.99  2.25 2.75 14.97 22.36  0.5 3.75 14.97 22.36  0.5 3.75 14.97 22.36  0.5 3.0 14.96 22.54  0.5 5.0 14.96 22.58	Volume Purged (gal) Volume Purged (gal) Water (feet) Temp. Conductance ms/cm or μS/cm  0.25 0.25 14.96 27.72 9.60  0.5 0.75 14.98 25.52 /0.1  0.75 1.50 14.98 25.52 /0.1  0.75 2.25 H.98 21.29 11.1  0.5 2.75 14.97 21.99 11.1  22.35 14.97 22.36 11.0  0.5 3.75 14.77 22.25 11.0  0.15 4.5 14.96 22.54 11.0  0.5 3.5 14.96 22.54 11.0	Volume Purged (gal) Volume Purged (gal) Water (feet) Temp. (°C) Conductance ms/cm or μS/cm Oxygen (mg/L)  0.25 0.25 14.96 27.72 9.60 1.93  0.5 0.75 14.98 25.52 10.1 (9.69  0.75 1.50 14.98 25.52 10.1 (9.69  0.75 2.25 μ.98 71.29 11.1 0.68  0.5 7.75 14.97 21.99 11.1 0.63  0.5 7.75 14.97 22.36 11.0 6.68  0.5 7.75 14.77 22.36 11.0 0.36  0.15 4.5 14.96 22.54 11.0 0.37  0.5 5.5 14.96 22.54 11.0 0.37	Volume Purged (gal) Volume Purged (gal) Volume Purged (gal) Volume Purged (gal) Volume Purged (gal) Volume Purged (gal) Volume Purged (gal) Volume Purged (gal) Volume Volume Purged (gal) Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volume Volu	Volume Purged (gal) Volume Purged (gal) Water (feet) Temp. (°C) ms/cm or μS/cm (mg/L) water (feet) Volume (gal) Volume Purged (gal) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (feet) Volume (f	Volume Purged (gal) Volume Purged (gal) Water (feet) (°C) Conductance ms/cm or us/cm (mg/L) (standard units) (NTUs)  0.25 0.25 14.96 29.72 9.60 1.43 9.87 -161 6.53  0.5 0.75 14.98 25.52 10.1 (0.69 9.77 -185 570  0.75 1.50 14.98 24.26 (0.5 0.43 9.72 -201 481  0.75 2.25 H.9B 21.29 11.1 0.68 9.72 -29 412  0.5 2.75 14.97 21.99 11.1 0.63 9.72 -29 412  0.5 3.75 14.77 22.36 11.0 6.68 9.72 -188 65.4  0.5 3.75 14.97 22.36 11.0 0.36 9.71 -204 51.1  0.15 4.5 14.96 22.54 11.0 0.37 9.71 -202 41.4  0.5 3.5 14.96 22.54 11.0 0.37 9.72 -202 41.3

 Well Capacity (Gal/Ft):
 0.75'' = 0.02;
 1" = 0.04;
 1.25'' = 0.06;
 2" = 0.16;
 3" = 0.37;
 4" = 0.65;
 5" = 1.02;
 6" = 1.47;
 12" = 5.88 

 Tubing Inside Diameter Capacity (Gal/Ft):
 1/8" = 0.0006;
 3/16" = 0.0014;
 1/4" = 0.0026;
 5/16" = 0.004;
 3/8" = 0.006;
 1/2" = 0.016;
 5/8" = 0.016;

 Stabilization Criteria Range:
 Specific Conductance:  $\pm 5\%$ ;
 Dissolved Oxygen:  $\pm 0.2$  mg/L or 10% saturation,
 pH:  $\pm 0.1$  unit;
 Turbidity: <10 NTU</td>

	Field Filtered:	Yes/ No	Filter Size:	Duplicate:	Yes/ No	Duplicate ID:	Time:	MS/MSD: Yes/ No
I	NOTES: (Sa	mple Analys	is, Field Screening	Analysis, f	Photograph	Information, Ratio	nal for Sample Method Used	l, Well Observations/ Conditions.)
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SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 8 27 13							
WELL NO: SMS MWT A	SAMPLE ID: SMSMW7A	SAMPLE TIME: 1030							
WEATHER CONDITIONS/ GENERAL OBSERVA	WEATHER CONDITIONS/ GENERAL OBSERVATIONS:								

	PURGING DATA	
Well Type: Pv-C Well Diameter (inches): 7 Tubing Diameter (inches): 3/16ID x 0.25OD Tubing Material: PTFE (Teflon)	Pump: (S/N): Pers Protect of 999 Water Quality Meter: (S/N): Hern Dr. U-5000 Turbidity Meter: (S/N): Water Level Indicator: (S/N): Secure ST	Total Well Depth (feet):  Screen Interval (feet)  Static Depth to Water (feet)  Tubing Depth (Begin/End)
= ( feet -	tal Well Depth - Static Depth to Water) X Well Capacity feet) X gallons/foot = gallons	Volume to be Purged (gailons):  Total Volume Purged (gailons):
Purge Method: Traditional Multiple	Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	

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Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance (ms/c/m or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
0841	0.25	6.25	16.35	21:38	> 100,5	102	5.85	235	X	CLOUDY
0912	0.75	1.0	3164	20.12	7100.0	0.75	5.98	219	X	الم و و مع
0923	0.5	1.5		20.36	>100.0		603	ZIB	484	40007
0935	0.5	200	16.40	20.54	> 1000	0.56		223	280	· · · · · · · · · · · · · · · · · · ·
0952	0.5	2.5	16.41	21.01	2,00,0	0.50	6.11	221	214	·
1013	0.75	3.15	16.42	21.50	700.0	6.48	6.14	222	6.108	
1028	0.5	3.75	16.41	72.01	2 1000	0.50	6.16	222	4.96	·
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Well Capacity (Gal/Ft):  $0.75^{\circ} = 0.02$ ; 1'' = 0.04; 1.25'' = 0.06; 2'' = 0.16; 3'' = 0.37; 4'' = 0.65; 5'' = 1.02; 6'' = 1.47; 12'' = 5.88 Tubing inside Diameter Capacity (Gal/Ft): 1/8'' = 0.0006; 3/16'' = 0.0014; 1/4'' = 0.0026; 5/16'' = 0.004; 3/8'' = 0.006; 1/2'' = 0.010; 5/8'' = 0.016 Stabilization Criteria Range: Specific Conductance:  $\pm 5\%$ ; Dissolved Oxygen:  $\pm 0.2$  mg/L or 10% saturation, pH:  $\pm 0.1$  unit; Turbidity: <10 NTU

#### FIELD SCREENING SUMMARY

Field Filtered: Yes/ No Filter Size: Duplicate: Yes/ No Duplicate ID: Time: MS/MSD: Yes/ No NOTES: (Sample Analysis, Field Screening Analysis, Photograph Information, Rational for Sample Method Used, Well Observations/ Conditions.)

FURSIONY BLINKING 0.00. WATER CLOUDY ESTIMATED TURB. W/OU COLOR LAMOTTE ZOZO WE BROWN HT ONSITE AND CALIBRATED

SAMPLER(S) SIGNATURE:	 	 	



SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 8 27/13						
WELL NO: 525 M-7B	SAMPLE ID:	SAMPLE TIME: 11 85						
WEATHER CONDITIONS/ GENERAL OBSERVATIONS:								

-0	PURGING DATA	
Well Type:	Pump: (S/N): PERLI VIALE # 019557	Total Well Depth (feet):
Well Diameter (inches): 2 **	Water Quality Meter: (S/N): House 019351	Screen Interval (feet)
Tubing Diameter (inches): 3/16ID x 0.25OD	Turbidity Meter: (S/N): LAMORTE 2020 UE	Static Depth to Water (feet)
Tubing Material:	Water Level Indicator: (S/N):	Tubing Depth (Begin/End)
PTFE (Teflon)	Sou ~55	~36.0
· · · · · · · · · · · · · · · · · · ·	tal Well Depth - Static Depth to Water) X Well Capacity	Volume to be Purged (gallons):
= ( feet - Purge Method: Traditional Multiple	feet) X gallons/toot = gallons  Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	Total Volume Purged (gallons):

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Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
0940	ζ-	TART	BREE	· · · · · · · · · · · · · · · · · · ·					·	COUDY
1022	3.24	3.25	3.25	18.71	95.8	6.348	6.43	203	2.94	
1032	6.25	3.50	10.16	19.44	94.8	037	6.43	184	3.21	
10055	4.25	4.50	18.09	(4.78	95.8	0.31	6.44	156	1.60	
1/02	0.5	5,0	12.04	19.76	95.1	0.30	6.45	152	7.86	
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Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 Tubing Inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/15" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU

Į	Field Filtered:				Yes/ No	Duplicate		Time:			Yes/ No	
ĺ	NOTES: (Sa	mple Analy	sis, Field Screening	Analysis,	Photograph	Information	, Rational fo	r Sample Method Used	l, Well Obse	rvatio	ns/ Conditions.	)
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**GROUNDWATER SAMPLING LOG** 

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SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 5/27/13								
WELL NO: SAS AW 128	SAMPLE ID: SMS NW 12 B	SAMPLE TIME: 1532								
WEATHER CONDITIONS/ GENERAL OBSERVATIONS:										

	PURGING DATA	•
Well Type: Pv	Pump: (S/N): GEO SUB	Total Well Depth (feet): 62
Well Diameter (inches): 2 /	Water Quality Meter: (S/N): /10 218 A 15000 Fine 020894	Screen Interval (feet)
Tubing Diameter (inches): 3/16ID x 0.25OD	Turbidity Meter: (S/N): LAMOTTE ZOZOVE	Static Depth to Water (feet)  5 32 6  Tubing Depth (Begin/End)
Tubing Material:	Water Level Indicator: (S/N):	Tubing Depth (Begin/End)
PTFE (Teflon)	Water Level Indicator. (5/N): Source 5T	58
1 WELL VOLUME PURGE = (To = ( feet -	tal Well Depth - Static Depth to Water) X Well Capacity feet) X gallons/foot = gallons	Volume to be Purged (gallons):
,	Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	Total Volume Purged (gallons):

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
1321	0.75	0.75	33.12	18.00	3.64	0.82	2.63	52	2750	OLANGE
1327	1.25	1.0	33.08	18.93	3.13	0.67	7.27	77	1720	
1341	1.00	7.00	33.04	70.20		0.57	7.25	92	152	
1356	1.00	4.0	33.04	70.09	2,50	0.48	7.26	88	74	
1410	/.02	5	33.04	20.27	2.38	6.42	7.25	68	140	
MZZ	1.0	6.0	33.04	20.63	7.30	6.39	7.25	61	109.8	
114 35	10	7-0	33.04	20.21	2.23	0.36	7.20	59	42.3	
1449	1.0	8.0		20.05	2.17	0.34	7.20	57	19.3	
1502	1.3	9.0	73.04	20.37	2.12	0.34	7.18	50	120	
1516	1.0	10.0	33.34	20.15	2.13	6.32	7.20	45	11.28	
1529	1.0	11.5	33-04	20.31	2.08	0.30	7.21	42	9.62	
	0							á		
					_ <del>_</del>					

Well Capacity (Gal/Ft): 0.75'' = 0.02; 1'' = 0.04; 1.25'' = 0.06; 2'' = 0.16; 3'' = 0.37; 4'' = 0.66; 5'' = 1.02; 6'' = 1.47; 12'' = 5.88 Tubing inside Diameter Capacity (Gal/Ft): 1/6'' = 0.0006; 3/16'' = 0.0014; 1/4'' = 0.0026; 5/16'' = 0.004; 3/8'' = 0.006; 1/2'' = 0.010; 5/6'' = 0.016 Stabilization Criteria Range: Specific Conductance:  $\pm 5\%$ ; Dissolved Oxygen:  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.006$ ;  $\pm_0 0.0$ 

	FIELD SCREENING SUMMARY										
Field Filtered:	Yes/ No	Filter Size:	Duplicate:	Yes/ No	Duplicate ID:	Time:	MS/MSD: Yes/ No				
NOTES: (Sar	nple Analys				Information, Rational fe	or Sample Method Used, \	Vell Observations/ Conditions.)				
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## Historic Purge and Well Information

	Well ID	Screen Interval	June 2013 DTW	Purge time	Pump	Comment	Final Turb.	•
· /	01A	30-40	37	<1 hr	Sub	draws down	57	31,71
	02A	17-27	14	<1 hr	Peris.	good recharge	6.5	14.96
	03B	56-6 <del>6</del>	<b>38</b> .	2 hr	Sub	draws down		32,98
_	04A	33-43	41	1 hr	Sub	draws down	236	37,35.90
	07A	13-23	21	2.2	Sub	dry	13	16.23
V	07B	30-40	23	- 4 hrs 🤫	Sub	slow recharge	150	17.83
	A80	25-35	26 ,	<b>1.7</b> hr	Sub	J	>1000	21.88
マガ	10A	22-32	18.5	1 hr 🕺	Peris.		9.4	23.5723.16
Ü	10B	60-70	29	1.5 hr	Sub		8.8	23,10
	11A	15-30	3.6	3.5 hr	Peris.		7.2	5,70
^	11B	41-56	5.9	2.0 hr	Peris.		2.9	7.70
	12A	24-40	30.5	1.5 hr	Sub		2.3	32,77
V	12B	52-62	29.8	4.5 hr	Sub	good recharge	10.1	32,69
V	13A	20-30	20.1	2 hrs	Su,b .	•	5.2	28.6018.62
~	13B	56-71	25	1.2 hr	Sub		7.2	31.53

1A } Bladder pump

8/26 10 A 23.77 10 B 23.53 13 A 28.77 13 B 31,70

## **SMOKEY MOUNTAIN SMELTERS**

**Knoxville, Knox County, Tennessee** 

## August 2013 Quarterly Event 1 Remedial Investigation / Feasibility Study

Groundwater Sampling Log
Book 2 of 3





## **INSTRUMENT AND CALIBRATION LOG**

Site Name:									•		
Sampling Eve	ent:				<u> </u>		<del></del>		}		
Instrument/M	eter Mar	nufacturer:		Ту	pe of Instrument: ఉவ	Water quality ?	Air Monitor ?				
	Model #	0-53			Manufacturer Serial	# PINE +208	74-/019 119	_	1		
	1110000111			Instrument Readings							
Calibration Date	Time	Parameter Calibrating	Bump reading	Ok to use?		Calibrated Reading	End of Day Bump	Initial	1		
8/28/13	0859	PH	reading	use:	Signature	4.0	readings 4.14	Ase	†		
0/20/13	0659	COND	<u> </u>		DADRINGE	4.49	4.64	ALL	-		
	0859	20			Addennates	126.0	99.270	416	1		
	2659	TURB			Al Grunke	0,0	0.0	AJG	1		
8/27/13	0804	PHY			A GREMINICO	4.01	4.05	A16	]		
1		COND				4.48	10,8	7	<u>}</u>		
		Do		<u></u>		112.0	+22.118.9				
<u></u>	<u></u>	TURB			<u> </u>	0.0	12.0	<u> </u>	LICO AME		
8128113	0830	404			Juny _	4,01	4.17	30	- 453 AMF PINE 019315		
	l	449 cond			<del>  _  </del>	4.49	4.7	<del>                                     </del>	1,120 0, (3,3		
	ļ <u>.                                    </u>	ONTU			<del>                                     </del>	0.0	W. (4.3 NTU	<del>                                     </del>	4		
	<del> </del>	DOMIL	<u> </u>		\	8.58	7.47	1 2 2			
8/28/13	0835		<u> </u>		A. GRIMAKE	4,0	4.18	3n	US3 HORIBA PINE 19119		
	<del> </del> -	4.49 GOND			<del>                                     </del>	4,49	4.78	<del>                                     </del>	Pine 19117		
	<del> </del>	DNT			9.	0.		<del>                                     </del>	4		
8/29/13	20015	Domit				10690 44.02 54.52	10.56		tours unda		
8127117	0745		1		for _	17502	4.60	<del>}</del>	U53 Horsa OZ4044		
<b></b>	<del>                                      </del>	4.49 ond	<u></u>	<u> </u>	<del> </del>	0-00	4.48	<del> </del>	1 00 1-11		
	<del> </del>					76.7	8-17	<del> </del> -	4		
Dusco		DOMSIL north 202	0.10	<del></del>		+ 10. F	8-11	<del>}</del>	†		
JE USC	Low	10NIU	pwe		<del> </del>	126		<del> </del>	-{		
<del></del>	<del> </del>	20171			<del> </del>	19.1	<del> </del>	<del> </del>	1		
<del></del>	<del> </del>	1 20 10 10		}		<del>                                     </del>	<del> </del>	<del> </del>	†		
L	<u> </u>	<u> </u>					<del></del>		J		



**GROUNDWATER SAMPLING LOG** 

- AIRIGH   COLUMN TO AIR	MEDITIES ( EGGISTIAS		<u> </u>						
SITE NAME: Sr	mokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 8-26-13						
WELL NO:	MW IOB	SAMPLE ID: 5MSMW 10B	SAMPLE TIME: 1145						
WEATHER CONDITIONS/ GENERAL OBSERVATIONS:									

	PURGING DATA	
Well Type: PVC	Pump: (S/N): Sub Peristalic Pine SN	Total Well Depth (feet): 70
Well Diameter (inches): 2 "	Pump: (S/N): Sub Peristulic Pine SN  Water Quality Meter: (S/N): U-53 Horiba 00193  Turbidity Meter: (S/N): Pine SN 021143	Screen Interval (feet) 60-70
Tubing Diameter (inches): 3/16ID x 0.25OD	Turbidity Meter: (S/N): PINE SN 021143	Static Depth to Water (feet)
Tubing Material:	Water Level Indicator: (S/N): Solins+ Pine S/N 007620	23/33 Tubing Depth (Begin/End)
PTFE (Teflon)	007620	63'
1 WELL VOLUME PURGE = (Total	al Well Depth - Static Depth to Water) X Well Capacity  feet) X gallons/foot = gallons	Volume to be Purged (gallons):
\ \	Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	Total Volume Purged (gallons):

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Condustance (ms/cm) or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
1045	0,75	0.75	23,56							3
1103	0,25	0.25	23.70	27.56	1.43	1.03	6.53	205	3,33	clear NO
1117	1.0	3.0	23.72	26.81	1,45	0.87	6,48	207	2,89	и
124	0.5	2.5	23.12	26.45	1,48	0.85	6.47	208	1.47	4)
1139	0.5	3,0	23.72	26,39	1,49	0.74	6.47	211	2.81	
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					-			Sylver i	_	
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								85 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
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Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.26" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

Stabilization Criteria Range: Specific Conductance: ±5%; Dissolved Oxygen: ±0.2 mg/L or 10% saturation, pH: ±0.1 unit; Turbidity: <10 NTU

## FIELD SCREENING SUMMARY

	Duplicate: Yes/	Duplicate ID:	Time:	MS/MSD: Yes/No
NOTES: (Sample Analysis, Field Screening	_	Information, Rational	for Sample Method Used,	Well Observations/ Conditions.)
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Page 1 of 7



SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 8-26-13							
WELL NO: MW OA	SAMPLEID: SMSMW10A	SAMPLE TIME: 1440							
WEATHER CONDITIONS/ GENERAL OBSERVA	WEATHER CONDITIONS/ GENERAL OBSERVATIONS:								

#### DUDGING DATA

	PURGING DATA_	
Well Type: PVC	Pump: (S/N): PERISTALTIC PINE 01994	Total Well Depth (feet): 321
Well Diameter (inches): 2 *	Water Quality Meter: (S/N): How BA J. 5000 019119	Screen Interval (feet)
Tubing Diameter (inches): 3/16ID x 0.25OD	Turbidity Meter: (S/N):	Static Depth to Water (feet)  35.07  Tubing Depth (Begin/End)
Tubing Material: PTFE (Teflon)	Water Level Indicator: (S/N): SoLI & ST	Tubing Depth (Begin/End)
1 WELL VOLUME PURGE = (Tol	lal Well Depth - Static Depth to Water) X Well Capacity  feet) X gallons/foot = gallons	Volume to be Purged (gallons):
	Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	Total Volume Purged (gallons):

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp.	Specific Conductance ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
1305	2	2	25.09	19,04	5,75	2.18	3.81	460	14.4	
1311	0.5	25	26.30	20.31	5.77	1.90	3.80		14.7	
1316	6.5	3.0	24.37	20.99	5.15	1.79	3.81	464	12.5	
1325	0.35	3,25	26.50	24.94	5.33	1.50	3.85	458	12.0	
133	125	49	2668	16.12	5,26	136	3,89	466	45,4	
1345	123	6575	76.75	1993	GIV	1.87	3.19	4/49	15/	_ <del></del> -
VZ55	025	U 00	26 90	20,04	6.14	1,82	3.77	472	60,4	
1400	#2S	4/25	26.85	1994	6,24	1182	3,77	470	57,7	
1910	US	950	26.95	213	6.85	1.65	3117	413	66	
1420	, US	9/15	1690	7196	6.08	1,87	3,18	472	64	
	<u> </u>	<u></u>				·				
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Well Capacity (Gal/Ft): 0.75'' = 0.02; 1" = 0.04; 1.25'' = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/6" = 0.016 Stabilization Criteria Range: Specific Conductance:  $\pm 5\%$ ; Dissolved Oxygen:  $\pm 0.2$  mg/L or 10% saturation, pH:  $\pm 0.1$  unit; Turbidity: <10 NTU

#### **FIELD SCREENING SUMMARY**

-	Field Filtered: Yes/ No	Filter Size:	Duplicate: Yes	s/ No Duplicate I	D: <u>Ti</u> me:	MS/MSD: Yes/ No
-	NOTES: (Sample Analy	vsis, Field Screening	Analysis, Phot	tograph Information,	Rational for Sample Method Used, Wel	Observations/ Conditions.)
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SAMPLER(S) SIGNATURE:

SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 8-27-13						
WELL NO: MWOLA	SAMPLE ID: SMS MWO/A	SAMPLE TIME: 1045						
WEATHER CONDITIONS/ GENERAL OBSERVATIONS:								

PURGING DATA

	I GRANA DATA	
Well Type: PVC	Pump: (S/N): MP50 / Bladder pump	Total Well Depth (feet): 4-0
Well Diameter (inches): 2 "	Water Quality Meter: (S/N): Horiba U53, Pine SW 019119	Screen Interval (feet) 30-40
Tubing Diameter (inches): 3/16ID x 0.25OD	Turbidity Meter: (S/N): Horiba	Static Depth to Water (feet)
Tubing Material:	Water Level Indicator: (S/N): Solins + 100	Tubing Depth (Begin/End)
PTFE (Teflon)	fine SN 019014	~33
1 WELL VOLUME PURGE = (Tot	al Well Depth - Static Depth to Water) X Well Capacity feet) X gallons/foot ≈ gallons	Volume to be Purged (gallons):
Purge Method: Traditional Multiple	Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	Total Volume Purged (gailons):

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
0940	0,5	0.5	32.07	18.92	82	5,0	6.44	187	144	No brownis
0950	0.5	1,0	32,10	19.34	85	4,6	6.45	189	122	No/ 11
1005	0.5	1,5	32,12	20,07	87	4,2	6.46	190	95	No [ 11
1020	0,5	2,0	32.12	20.63	88	4,0	6.47	190	76	K #
1030	0.5	2.5	32.13	21,18	88	3.8	6.46	189	64	11 11
1040	0.25	2.75	39.13	21.38	88	3.7	6.46	190	57	H 1
1045	0.20	3.0	32.13	21.68	87	3,6	6,46.	190	54	pe la
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Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU

### FIELD SCREENING SUMMARY

	Duplicate: Yes No	Duplicate ID:	Time:	MS/MSD: Yes/
NOTES: (Sample Malysis, Field Screening	Analysis, Photograph	Information, Rational	for Sample Method	d Used, Well Observations/ Conditions.)
Routen	e Low	flow/Lou	u Stress	nid-screen
	int	take place	ace ment	
	,			

SAMPLER(S) SIGNATURE: Ilhhe



SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 6/28/13
WELL NO: SAS MUNOCIA	SAMPLE ID: SMS MW 04A	SAMPLE TIME: (23)
WEATHER CONDITIONS/ GENERAL OBSERVA	ATIONS:	,

_	PURGING DATA							
Well Type:  Well Diameter (inches):  Tubing Diameter (inches):  3/16ID x 0.25OD  Tubing Material:  PTFE (Teflon)	Pump: (S/N): QED DLANDER PIME 21847  Water Quality Meter: (S/N): HORBA U 53  Turbidity Meter: (S/N): LAMOTTE 2020 (UE  Water Level Indicator: (S/N):	Total Well Depth (feet):  Screen Interval (feet)  Static Depth to Water (feet)  Tubing Depth (Begin/End)						
= ( feet -	Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	Volume to be Purged (gallons): Total Volume Purged (gallons):						

7 4. 30			voidino i digo	/					<u> </u>	
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
1029	0.25	1.25	36.06	24.21	25.1	5.68	5.71	286	132	
1040	0.5	0.75	36.12	22.36	23 4	4.92	5.91	240	82	
los4_	0.25	1.0	36.15	22.25	24.0	6.00	5.98	217	52:7	
1/13	6.5	1.5	3619	22.04	24.1	3.89	608	205	39.8	
1129	0.5	2.0	36.19	2220	25.0	4.66	6.15	199	24.9	
1140	0.25	2.25	36.19	22.20	24.6	4-70	6.20	193	17.8	
1150	0.25	2.5	36.17	23.07	24.3	3.36	6.19	196	14.3	
1204	0.25	2.75	36 18	22.56	24.6	3.39	6.22	197	12.5	
1215	0.25	3.5	36.17	23.11	24.6	4.61	6.27	197	12.01	
1827	0.25	3.25	36.17	22.49	25.	4.50	631	194	9.5%	
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								, u		

Well Capacity (Gal/Ft): 0.75'' = 0.02; 1'' = 0.04; 1.25'' = 0.06; 2'' = 0.16; 3'' = 0.07; 4'' = 0.65; 5'' = 1.02; 6'' = 1.47; 12'' = 5.88 Tubing inside Diameter Capacity (Gal/Ft): 1/8'' = 0.0006; 3/16'' = 0.0014; 1/4'' = 0.0026; 5/16'' = 0.004; 3/8'' = 0.006; 1/2'' = 0.016; 5/8'' = 0.016 Stabilization Criteria Range: Specific Conductance:  $\pm 5\%$ ; Dissolved Oxygen:  $\pm 0.2$  mg/L or 10% saturation, pH:  $\pm 0.1$  unit; Turbidity: <10 NTU

Field Filtered: Yes/No	Filter Size:	Duplicate: Yes/ No	Duplicate ID:	_Time:	MS/MSD: Yes/ No
NOTES: (Sample Analys	sis, Field Screening	Analysis, Photograph	Information, Rational fo	r Sample Method Used, Wel	Observations/ Conditions.)
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SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 2/29/13
WELL NO: 5M5 MW11B	SAMPLE ID: 545 MW 11B	SAMPLE TIME: 15/0
WEATHER CONDITIONS/ GENERAL OBSERVA	TIONS:	

					PURGING I	DATA						
Well Type	Pre		Pump: (S/N)	PER 15	TAUTU	PINE	1815	 २	Total Well Depth (feet)			
Well Diam	eter (inches):	こ"	Water Qualit	y Meter: (S/N	): HORIB	7351	Screen Inten	/al (feet)				
Tubing Did	Pump: (S/N): PER 15 TAKTIC PINE 1883  meter (inches): Z"  water Quality Meter: (S/N): Holiba JS3 019351  Turbidity Meter: (S/N): Lamorre 70 2000 04294  water Level Indicator: (S/N):									Static Depth to Water (feet)		
Tubing Ma	Tubing Material: Water Level Indicator: (S/N):									Tubing Depth (Begin/End)		
PTFE (Ter	flon)				50Uz	55 7			-50			
	OLUME PUP				h to Water) X	Well Capacit			Volume to be Purged (gallons):			
= ( Purge Me	feet thod: Tradition		feet) X Volume Purge	J	ns/foot = n the Top") or L		gallons ubing in Mid §	Screen")	Total Volume	Purged (gallons):		
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation		
1 1 1	4	Γ .	0 1 "	_ /			42 . /	1 / /	37 (3			

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
1425	0.25	0.25	9.40	24.01	17.4	2.86	3,44	166	229	DANKGRAY
10136	D.75	1.0	9.47	18.35	17.5	6.59	B, 53	-90	4.43	
1447	lio	2.0	7.62	18.61	17.1	0.49	8.58	-79	6.36	Scower Prap
1458	1.0	შ.ა	9.46	1930	16.8	042	9.58	- 75	2.43	
1503	0,5	3.5	9.45	19.36	16.9	041	8.57	- 73_	1.91	
1508	0.5	40	943	19.50	169	1 40	856	-71	366	
					V - 1	0, 1				
V 1			<u></u>				<u> </u>			
		l 								
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			 					, 		
				\$ N ₁						

Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 Tubing Inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU

					OTTECHNING S			<del></del>
ield Filtered:	Yes/ No	Filter Size:	Duplicate:	Yes/ No	Duplicate ID:		Time:	MS/MSD: Yes/ No
OTES: (Sa	mple Analy	sis, Field Screen	ing Analysis, I	hotograph	Information, Ra	tional for Samp	le Method Used,	Well Observations/ Conditions
								•
						•		•
					1			
								<u> </u>
MPLER(S)	SIGNATUI	RE:						

ASSOCIATES, I) vision*  environmei	GROUNDWATER SAMPLING LOG										
SITE NAM	IE: Smokey	Mou <u>n</u> tain Sı	nelter Site	SITE LOCA	TION: Knox	ville, Tennes	see		DATE: 8	129/13	
WELL NO	· Mu	ABON		SAMPLE ID	: SW	SMWS	84		SAMPLE TIN	ME: 1505	
WEATHER	CONDITIO	NS/ GENER	AL OBSERVA	TIONS:	azy/i	John					]
	P		- (O.0.)	<u> </u>	PURGING						1
Well Type:	MUS	h	Pump: (S/N)		1	1			Total Well De	epth (feet):	
Well Diam	eter (inches):	2) N	Water Qualit	y Meter: (S/N)	Horbe	< 027	1044		Screen Interv	al (feet) 98	
1 -	meter (inche	s):	Turbidity Me	ter: (S/N):	amothe	200	we al	9296		to Water (feet)	
	Tubing Material: Water Level Indicator: (S/N):										
PTFE (Teflon)  Mud Screen											
	1 WELL VOLUME PURGE = (Total Well Depth - Static Depth to Water) X Well Capacity Volume to be Purged (gallons):										
,	= ( feet feet) X gallons/foot = gallons  Purge Method: Traditional Multiple Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")										
ruige ive		Total		( Gipping non	Specific			oreen /			<u>)</u> II
Time	Time Purged (gal (gal) Volume Purged (gal) Volume (°C) Temp. (°C) Ussorved Oxygen (mg/L) Ussarved (mg/L) Volume Oxygen (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) (m										
0805		0.5	22.50	2107	#5	1.02	8.51	-(31	7-39	rust/clev	oly
0811	1.0	1.5	22.75	20,40	7.79	0.19	8.50	<u>-152</u>	1966	(051	, ,
0816	\$.0	2.5	22.79	20.54	7.87	0.22	8.49	-15/	12.65	الكال وما كا	POM
0827	1.0	3.5	22.57	21.66	8.10	0.09	8.49	777	844		
0634 0639	0.5	4.0	22.49	21.69	8.12	0.09	8.50	-235 -241	635		
0845	0.5	5.0	22.49	21.69	8.15	(9.11	850	-245	125	<del></del>	
851	0.5	5.5	22.49	21.68	81.8	0.13	8.51	-243	109		
0857	0.5	6.0	22.49	21.71	8.21	0.11	8.51	-245	93.3		0,00
0903	0.5	6.5	22.51	21.64	8.28	0.18	852	-250	77.8	#Aglow 3	1, 0, 1,
0922	1.0	7.5	22.47	22.49	8.32	0.12	8.52	-(4)	44.7		
1004	0.75	9.5	22.46	22.53	8.36 U 40	0.10	B.55	-1 <i>/</i> 6	18.3	<del></del>	
						0-1			1.47: 12" - 5.00		il T
Well Capac Tubing Insi- Stabilization	de Diameter C	apacity (Gal/F	t; 1" = 0.04; it): 1/8" = 0.00; Conductance: ± 8	06; 3/16" = 0.0	014; 1/4" = 0.0	026; 5/16" = 0	0.004; <b>3/8</b> " = 0	0.006; <b>1/2</b> " =	1.47; <b>12"</b> = 5.88 0.010; <b>5/8"</b> = 0. <b>Turbidity</b> : <10 N	016	
					SCREENING						J
	7										]
NOTES:	ed: Yes/Na (Sample Ana	Filter Siz dysis, Field S	creening Anal	cate: Yes/No ysis, Photogra	Duplicate ph Information	, Rational for	Time: Sample Meth		MS/MSD: Vell Observation	ns/ Conditions.)	
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SAMPLER	R(S) SIGNAT	URE:			<del>_</del>						

120	re
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0.00

<b>对放外</b>	Well ID  01A   02A   03B  04A  07A   07B   08A  10A   11A  11B  12A  12B  13A   13B	17-27 56-66 33-43 13-23 30-40 25-35 22-32 60-70 15-30 41-56 24-40 52-62 20-30	June 2013 DTW  37  14  38  41  21  23  26  18.5  29  3.6  5.9  30.5  29.8  20.1	Purge time <1 hr <1 hr 2 hr 1 hr 2.2 4 hrs 1.7 hr 1 hr 1.5 hr 3.5 hr 2.0 hr 1.5 hr 4.5 hr	Pump Sub Peris. Sub Sub Sub Peris. Sub Peris. Sub Peris. Sub Sub	Comment draws down good recharge draws down draws down dry slow recharge	10.1	31.71 14.96 32.98 35.90 16.23 17.83 21.88 23.16 23.16 23.18 5.70 7.70 32.77
~	13A V	20-30 56-71	20.1 25	2 hrs 1.2 hr	Sub Sub			28 to 28,62 31.53

[	$\frac{4}{8}$ Blad	der peing	2	·
_ \	A	·		Fetz
mg/L Fe 0.00	-02A -03B -04A -07A	Sangh Bati 8/27 8/26	Sample Time 1045 1642	SWOI 0.12 5WOY 0.03 SWIZ 0.04 SWO8 0.06 SWO8S 0.09 SWO3 0.00 SWOI 0.00
0.V1	-07B -08A -10A -10B	8 (26 8 (26	De 1145 1440 De 1440 1145	
0.04	-11 B -12 B -13 A -13 B - SW Zd - SW OS		1132 Turbid	Fe/clesa.
0.00	5 5W 10	•		

## **SMOKEY MOUNTAIN SMELTERS**

**Knoxville, Knox County, Tennessee** 

# November 2013 Quarterly Event 2 Remedial Investigation / Feasibility Study

Groundwater Sampling Log
Book 1 of 3



## Historic Purge and Well Information Fe+ 2 Results

	Screen	June 2013	August	Nov 2013			.*
Well ID	Interval	DTW	2013 DTW	DTW	Purge time	Pump	Comment
0 <u>1</u> A	30-40	37	31.7	35.10	<1 hr	Sub	draws down
02A	17-27	14	14.96	16.28	<1 hr	Peris.	good recharge
03B	56-66	38	32.98	35,20	2-3 hr	Sub	draws down
04A	33-43	41	35.9	39	1-2 hr	Sub	draws down
07A	13-23	21	16.25	19.20	1.5-2 hr	Sub	dry
07B	30-40	23	17.83	21.65	1.5-4 hrs	Sub	slow 🆘
08A	25-35	26	22	24.55	1.7 hr	Sub	some
10A	22-32	18.5	25.1	29.40	1.5 hr	Peris.	slow 🖘
10B	60-70	29	23.3	27.80	1.5 hr	Sub	some
11A	15-30	3.6	5.7	<b>625</b> 11.33	5 1 hr	Peris.	good recharge
11B	41-56	5.9	7.7	10.38	0.5	Peris.	good recharge
12A	24-40	30.5	32.7	37,7	2.0 hr	Sub	some
12B	52-62	29.8	32.69	37.60	2-4 hr	Sub	good recharge
13A	20-30	20.1	28.6	600000	10 2 hrs	Sub	slow or dry
13B	56-71	25	31.7	38.20	1.2 hr	Sub	slow

## Groundwater Fe+2

## Surface water Fe+2

Fe+2	dilution?		Fe+2	dilution?	Result
01A		. 3477	SW01		
02A			SW02		
03B			SW03		
04A		0.06	SW04		
07A			SW05		~
07B			SW08		
08A		Θ	SW08 spring	•	
10A			SW09		
10B		6.38	SW09 spring		. 7
11A			SW10	v	
11B		0	SW11		
12A			SW12		
12B			SW13		
13A			SW14		
13B			SW20		





## **INSTRUMENT AND CALIBRATION LOG**

Site Name: SMOKEY MUNICULU SMELTERS

	<del></del>	Instr	rument Re				<u> </u>	
Date	Parameter	Calibration Value	Time	Bump Test Value	Time	Signature	Instrument Type/Manufacturer	Serial Number
11/12/13	conductivila	1.335	8:16				YSI 556 MAS	04L1385 AM
-st	PH 10 U	10.35	4:20					
10	PH. 7	6.88	8.18					
11.	ORP	D7.67	8-26					
11/13/13	conductioners	1,493	8:15				YSI556 MS	07L1385AM
iŧ	H7 0	4.04	8:19					
	PHIC	10.1	8.24	ļi		·		
	086	261.3	3:30					
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## **GROUNDWATER SAMPLING LOG**

•	Append Charleston Lawrence Length Co.	100112111111111111111111111111111111111	
	SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 11/12/13
	WELL NO: 1113	SAMPLE ID: MWILE	SAMPLE TIME: 9:40
	WEATHER CONDITIONS/ GENERAL OBSERVA	TIONS: EOLD, CLOUDY, WINDY	
		,	

## **PURGING DATA**

	PUNGING DATA	•
Well Type:	Pump: (S/N): 042/385 AM	Total Well Depth (feet): 56
Well Diameter (inches):	Water Quality Meter: (S/N):	Screen Interval (feet) 41-56
Tubing Diameter (inches):	Turbidity Meter: (S/N): 11/20001483	Static Depth to Water (feet)
3/16ID x 0.25OD Tubing Material:	Hach 2100 Q Water Level Indicator: (S/N): 201301	Tubing Depth (Begin/End)
PTFE (Teflon)	Solinst	
1 WELL VOLUME PURGE = (Tot	al Well Depth - Static Depth to Water) X Well Capacity feet) X gallons/foot = gallons	Volume to be Purged (gallons):
,	Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	Total Volume Purged (gallons):

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
8:44		<i>a</i> 25	11.28	14.56	15.93	0,99	8.36	215.2	52.4	Dear/Sulf
8:54	ୃଥିଷ	35°O	11.45	14.38	15-22	0.96	8.47	223.8	348	11
<b>9</b> :02	25	.75	11.51	14-49	15.18	1.75	8.48	225.4	2.52	ft
9.08	ΩS.	1.00	1154	14.29	15.20	2.23	8.48	2,20.5	0.59	11
9:17	.50	1.50	11.56	14.26	15.16	1.53	8.49	209.1	0.50	/6
9:27	.50	2.00	11.58	14.36	15.15	1.41	8.48	193.8	0.48	11
9:36	.50	2.50	11.60	14,29	15.20	337	8.48	190.6	0.59	1 p
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Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU

## FIELD SCREENING SUMMARY

Field Filtered: Yes/ No		Duplicate:		Duplicate ID:	Time:	MS/MSD: Yes/ No
NOTES: (Sample Analy	sis, Field Screening	Analysis, F	hotograph	Information, Ration	al for Sample Method Used	d, Well Observations/ Conditions.)
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			٠			
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Page 1 of 8

TE NAME: Smokey Mountain Sr	nelter Site S	ITE LOCATI	ION: Knox	ville, <u>Tenn</u> es	see		DATE:	<b>3/</b> 13
ELL NO: 12A	s	AMPLE ID:	Mh	ЛQA			SAMPLE TI	ME:
EATHER CONDITIONS/ GENERA			-D, C	LOUDY	, WIN	07		
	<del>-</del> -	F	URGING	DATA	í A	<del>- 61-1-</del>	<del>,                                      </del>	
ell Type:	Pump: (S/N): Q	4643	45/	M geo	tech 2	061	Total Well D	epth (feet): 4-0
elf Diameter (inches):	Water Quality M			<b>ن</b> بر				val (feet) 34-210
oing Diameter (inches): 6ID x 0.25OD	Turbidity Meter: Water Level Indi	(S/N): 1 (1	2060	14834			Static Depth	to Water (feet)
bing Material:	Water Level Indi	cator: (S/N):	20130	P)			Tubing Dept	h (Begin/End) 32
FE (Teflon)	Solinst	·						
VELL VOLUME PURGE = (Total feet	al Well Depth – S feet) X	itatic Depth t gallons		Well Capacit	y gallons			e Purged (gallons):
rge Method: Traditional Multiple	Volume Purge ("Si	pping from ti	he Top") or l	_ow-Flow ("Τι	bing in Mid S	Screen")	Total Volume	e Purged (gallons):
ime Volume Volume Purged (gal (gat)	Depth to Water (feet)		Specific conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
19 0.50 0.50	38 1	6.95	2.172	2.65	6.86	100.3	265	cloudy for
32 025 0.75	11	7.472	183	2.94		10523	300	Dear / 1
490,25 1.00		6.14 3	2.170	2.78	6.83	85.2	192	murkey/
1/1/2 Actor	5 dry							
111113 7470	<del>V.</del> V							<del> </del>
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	21							
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				-				1
l Capacity (Gal/Ft): 0.75" = 0.02; ing inside Diameter Capacity (Gal/Ft illization Criteria Range: Specific C	1" = 0.04; 1.25 ): 1/8" = 0.0006; onductance: ± 5%;	3/16" = 0.0014	4: 1/4" = 0.0	026; 5/16" = 0	$0.004$ ; $3/8^{\circ} = 0$	0.006; 1/2" =	1.47; <b>12</b> " = 5.88 0.010; <b>5/8</b> " = 0 <b>Turbidity</b> : <10 N	.016
		FIELD S	CREENING	3 SUMMAR	Υ			
d Filtered: Yes No Filter Size		: Yes No	Duplicate		Time:			Yes/No
TES: (Sample Analysis, Field So								
1/14/13 1000		•						
et recharge, DTW	1=37.96	filled	2L 0	and let	rechar	ge ag	ain.	
te appears to b					•	-		
	•				. ا	,		~ 1I
Tubing was rem	loved due	to len	gth b	eing C	ut too	short	- and t	€II
110 00 11.								
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IBIONY ENVIRONMENTAL I FACILITIES I LOGISTICS GROUNDWATER SAMPLING LOG										
SITE NAM	IE: Smokey I	Mountain Sn	nelter Site	SITE LOCA	TION: Knoxy	DATE: 11/12/13				
WELL NO	· Mh	13A		SAMPLE	MV 13		SAMPLE TIME:			
WEATHER CONDITIONS! GENERAL OBSERVATIONS: COLD, CLOUDY, WINDY										
				<del>_</del>	PURGING I	DATA	<del></del>			
Well Type			Pump: (S/N):						Total Well De	epth (feet): '3 O
Well Diam	eter (inches):		Water Quality	y Meter: (S/N)	):				Screen Interv	ral (feet) 20-30
Tubing Dia	meter (inche	s):	Turbidity Met	er: (S/N):					Static Depth	to Water (feet) 🖚
Tubing Ma			Water Level ا المركزة كالع		1): 201301	l			Tubing Depth	(Begin/End) 25
1 WELL V = (	OLUME PUF	RGE = (Tota	al Well Depth feet) X	- Static Depti	n to Water) X	Well Capacity	y gallons	<del>_</del>	Volume to be	Purged (gallons):
-			Volume Purge	•		ow-Flow ("Tu	ū	creen"\	Total Volume	Purged (gallons):
yo me		Total		, cipping noti	Specific	_====		Crosti j	<del> </del>	==== ₁
Time	Volume Purged (gal	Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Conductance ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
MATO.	14/40	ورساً _	PC 13.	121						
				l/						
	 		·						<u> </u>	
		L <b>-</b>							<u> </u>	
<del></del>	<u> </u>	<del>   </del>		<del></del>					<del></del>	
		<del>   </del>	- <del>-</del> -				-5			·
		<del>   </del>	<del></del>		_ <del></del> _	<del></del>			<del>   </del>	
							-		<del></del>	
	<del>-</del>			<del></del>						<del></del>
	<del></del>				[ <del></del> -					
Well Capac Tubing insid Stabilization	de Diameter Ca	apacity (Gal/Ft	; 1" = 0.04; 1 i): 1/8" = 0.000 onductance: ± 5	6; 3/16" = 0.0	014; 1/4" = 0.0	026; <b>5/16"</b> = 0	0.004; $3/8$ " = 0.	.006; 1/2" =	1.47; <b>12"</b> = 5.88 : 0.010; <b>5/8"</b> = 0. <b>Turbidity</b> : <10 N	016
	<u>_</u>	<del>:</del>	<del></del>		SCREENING				<del></del> _	
Eigld Eilter	adı Van/Na	Eiltor Cize	Dunlik				Time:		MS/MSD:	You! No
	ed: Yes/No (Sample Ana	Filter Size lysis, Field Sc		cate: Yes/No sis, Photogra					Vell Observation	
-										
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SAMPLER	(S) SIGNATI	JRE:			<del></del>		<del></del>			



ITE NAME: Smokey Mot	ıntaln Smelter Site	SITE LOCA	TION: Knox	vi <u>l</u> le, Tennes	see		DATE:	12/13
ELL NO: OB	-	SAMPLE ID	: MI.	DB .		.*	SAMPLE TI	ME: 16:55
EATHER CONDITIONS	GENERAL OBSERVA		0000	Loup	4, W	WOY		
			PURGING	DATA	· }			
Vell Type:	Pump: (S/N	): 02409	5				Total Well D	epth (feet): 3
Vell Diameter (inches):	<b>I</b>	) ity Meter: (S/N)					Screen Inter	val (feet)
Fubing Diameter (inches):	Turbjdity M	eter: (S/N): } }	12060	1434			Static Depth	to Water (feet) $29$ .
3/16ID x 0.25OD Fubing Material:	1 11/4 (35	-{ Lindicator: (S/N		•			Tubing Dept	h (Begin/End)
PTFE (Teflon)	solins		-,					······································
WELL VOLUME PURGE	= (Total Well Depth feet) X	- Static Depti				-	Volume to be	e Purged (gallons):
= ( feet -	•	J			gallons	Caroa ***	Total Volume	e Purged (gallons):
Purge Method: Traditional	Total	= ( Sipping non	Specific			ocieen )	<del> </del>	
Time Volume V	olume Usater (feet)	Temp. (°C)	Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
	50 30.36	15.52	1.722	1.80	6.68	76.0	D.O.R,	Moderary
	00 29.34	15.87	1,689	0.93	6.64	70.	0.0-R.	Router
	50 29.40	16.00	1.727	0.80	6.62	69.7	347 72.3	doudett
	,50 29,45 ,50 29,41	15.04	1795	0.62	6,58	70,1	20.4	doubly
	.50 29.53	15.90	1.737	0,41	6,53	72.3	5.97	dem
			1					CSCAPE
- · · · · · · · · · · · · · · · · · · ·				_			_	
<del></del>		<del>  -</del>	_		<u> </u>	<u>.</u>		
							<u> </u>	
Vell Capacity (Gal/Ft): 0.	<b>75</b> " = 0.02; <b>1</b> " = 0.04;	<b>1.25</b> " = 0.06;	2" = 0.16; 3" :	= 0.37; 4" =	0.65; 5"=	1.02; 6" =	1.47; <b>12"</b> = 5.8	В
'ubing Inside Diameter Capac tabilization Criteria Range:			014; 1/4" = 0.0   Oxygen: <u>+</u> 0.2 r				0.010; 5/8" = 0 Turbidity: <10 i	
		FIELD	SCREENING	SUMMAR	ıY			
Field Filtered: Yes/ No	Filter Size: Dup	licate: Yes/No	Duplicate	ID:	Time	:	MS/MSD:	Yes/ No
								ons/ Conditions.)



SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 11/13 /13
WELL NO:	SAMPLE ID: MWORA	SAMPLE TIME: 10445
WEATHER CONDITIONS/ GENERAL OBSERVA	TIONS: EULO - CLEAR	

PURGING	DATA
---------	------

	PURGING DATA	
Well Type:	Pump: (S/N): 20617	Total Well Depth (feet): 35
Well Diameter (inches):	Water Quality Meter: (S/N):	Screen Interval (feet) 25-35
Tubing Diameter (inches):	Turbidity_Meter: (S/N): 1106 0C010007	Static Depth to Water (feet) $\mathcal{R}$ 3
3/16ID x 0.25OD Tubing Material:	Hack Water Level Indicator: (S/N): 2013() (	Tubing Depth (Begin/End) 32
PTFE (Teflon)	solinst	3 ( 3 ) ( 3 )
	(Total Well Depth - Static Depth to Water) X Well Capacity  feet) X gallons/foot = gallons	Volume to be Purged (gallons):
, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	, , , , , , , , , , , , , , , , , , , ,	Total Volume Purged (gallons):
Purge Method: Traditional Mult	iple Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	1

,										
Time	Volume Purged (gai	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
9:29	.50	1001	25.4	16.77	6.832	127	8.80	1305	0.0.R.	murkych
7:33	,5 O	1.50	25:37	16.80	6 933	1.20	8.80	1255	0.0.2.	n / "
5338	350	2.00	25.39	16.93	7.021	1.22	8.80	118.3	COR	tı
9:44	1.0	3.00	3550	コング	6.955	0.98	1,70	111-1	Įŧ	11
9150	1.00	4.00	25.56	17.23	7.088	1.02	8.78	101.8	a35	1.ess clondy
9:56	$i.\infty$	5.00	2553	17.19	7.137	1.01	8.79	99.1	<b>17</b> 2	11 11
100	, .	6.00	25.50	17.19	7.189	1.01	8.79	94.5	75.8	1( 1)
10:10	1.0E	7.00	2550	17.20	7.2018	os 12	3.80	36.4	41.7	. 11
	1.00	8.00	11	17.17	7.331	0.87	8.80	826	24.2	close
10:20	1.00	9.00	. 11	17.20	7376	0.81	8.80	80.0	16,7	11 11
10:29	1.00	10.00	Ð	17117	7.452	0.75	3.30	75.4		7 11 13
10:37	1.00	11.00	11	17.21	7.472	0.68	880	71.1	67	ri .
				,,,,	•		, ,			

Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88. Tubing Inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU

Field Filtered: Yes/ No Filter Size:	Duplicate: Yes/ No Duplicate ID: Time:	MS/MSD: Yes/ No
NOTES: (Sample Analysis, Field Screening	Analysis, Photograph Information, Rational for Sample Method Used, Well	Observations/ Conditions.)



SAMPLER(S) SIGNATURE:		 
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KISION'I ENVIRONMENTAL ( FACILITIES   LOGISTICS GROUNDWATER SAMPLING LOG									
SITE NAME: Smokey M	ountain Sn	nelter Site	SITE LOCA	ATION: Knox	ville, Tennes	see		DATE:	13/13
WELL NO: OLT	<i>[</i>		SAMPLE II	n: 14W	DAPC		-	SAMPLE TIN	ME: 15:15
WEATHER CONDITIONS	S/ GENER	AL OBSERVA		<u>ο. (</u>	Clost	<u> </u>		OMMP LL III	nc
				PURGING	DATA				
Well Type:		Pump: (S/N)	2061	7				Total Well De	opth (feet): 43
Well Diameter (inches):		geo peel Water Quality	y Meter: (S/N)					Screen Interv	/al (feet) 33-43
Tubing Diameter (inches)	:	Turbidity Met	er: (S/N): [¹]	06000	10007	7		Static Depth	to Water (feet)
Tubing Material: PTFE (Teffon)		Water Level		1081050	•		į	Tubing Depth (Begin/End) 🕂 🗸	
	F - /Tak	Soling		C I - Mista N V	Well Coppeit	<del></del>		10 h ( la la la	D. 47. 11
1 WELL VOLUME PURG		feet) X		n to water) x ens/foot =	wen Capacity	y gallons		İ	Purged (gallons):
Purge Method: Tradition	al Multiple \	√olume Purge	("Sipping fron	n the Top") or L	ow-Flow ("Tu	ibing in Mid S	Screen")	Total Volume	Purged (gallons):
Volume Time Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
13.17 .50	, <b>g</b> Ø	40.61	18.41	30,23	1.27	5,77	107.8	394	cloudes
13:20 .50	100	39.86	18.3]	2076	0,56	5.75	110.4	80	dreides
13:240.50	1,50	39.84	18,30	21.03	0.57	2.75	110.7	14.6	clouder
	2.00	19.85	18.35	21.24	0.47	5.74	109.8	59.9	donder
	2.50	- 11	19.52	2272	0.49	5.75	07.8	/ 1 /	<u> </u>
1350 50 3	3.00 3.50	11	20.35	27,19	0.35	576	104.3	45.6	clean
<del>                                    </del>	-		21.15	33.08	0.35		95.2 94.5	36	<u>(                                    </u>
	1.00 500	1)	4.1	27.44	0.38	5:15	64.4	59.6	<u>√. 1√</u>
	,00	10	1414	24.65	0.36	5.73	106.1	46.7	<u></u>
4:42 1.00	1.00	11	1471	26:14	กมร	5.77	114.6	22.1	0
	1.00	11 .	14.21	24.91	0.34	576	103.9	22.0	
1500 1.00 C	1.00	1,	18.18	2664	0.33	574	114.0	14.6	<b>1</b> 1
Tubing inside Diameter Cap	0.75" = 0.02; acity (Gal/Ft Specific C	): 1/8" = 0.000	6: 3/16" = 0.0	2" = 0.16; 3" = 1014; 1/4" = 0.00 100xygen; + 0.2 n	026: <b>5/16"</b> = 0	0.004; $3/8$ ° = 0	).006; 1/2" =	.47; <b>12</b> " = 5.88 0.010; <b>5/8</b> " ≃ 0.0 <b>Turbidity</b> : <10 N	016 (
Stabilization Criteria Range:	10.00	11	<u> </u>	17-X3		ا رہ حملا	118 9	75	7)
		<del>`</del>	LIELD	POREEINING	JOINTAN	13. 16	113,11	1100	
Field Filtered: Yes/No NOTES: (Sample Analys	Filter Size sis, Field So		sate: Yes/No sis, Photogra			Time: Sample Meth		MS/MSD: /ell Observation	
}		<b>.</b>				•			<i>'</i>
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		, <u>;</u>			<u>.</u> <del>-</del>				
SAMPLER(S) SIGNATUR	RÉ:	<del></del>							



<u>SITE NAM</u>	E: Smokey	Mountain Sn	nelter Site	SITE LOC	ATION: Knox	ville, Tennes	see		DATE: )	<u>/13/12</u>
WELL NO:	102	Å		SAMPLE II	D: 14WC	X5C			SAMPLE TIM	ME: 11:07
WEATHER	CONDITIO	NS/ GENER/	AL OBSERVA	TIONS:						
					PURGING	DATA	<del></del>		<del></del>	
Well Type:			Pump: (S/N)	):					Total Well De	opth (feet):
Well Diame	eter (inches)	:	Water Qualit	ty Meter: (S/N	):				Screen Interv	al (feet)
Tubing Diameter (inches): Turbidity Meter: (S/N):								Static Depth to Water (feet)		
3/16ID x 0. Tubing Mat PTFE (Tetl	erial:		Water Level	Indicator: (S/I	N):				Tubing Depth (Begin/End)	
1 WELL VO	DLUME PUF feet		al Well Depth feet) X		th to Water) X ons/foot =		y gallons			Purged (gallons):
Purge Met	hod: Tradition	onal Multiple	Volume Purge	("Sipping from	n the Top") or I	ow-Flow ("Tu	ubing in Mid S	Screen")	Total Volume	ruiged (gallons).
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
2321	0.5	0.5	16.35	17.66	7.987	1.07	10.16	74.9		Quan
10:27	0.5	1.0	ν	17.24	9.935	0.58	10.14	95.4	28.3	١,
10:34	0.5	1.5	11.	17.35	9.941	D.44	10-17	102.5	100 11	
10:49	0.5	2.5	i (t	17.05	9.965	0.40	<del>'</del>	104.1	4.93	- ' '
11:05	0,5	3.5	- '1	17.23	9977	5.26	10.13	101.7	1,1	
					<del>                                     </del>	<del></del>				
			<del></del>		<del> </del>	<del></del>				
			<del></del>		<u> </u>	<u> </u>	l.		<del></del>	
			===	<u> </u>	<u> </u>	<u> </u>	<u></u> =			
Well Capacit Fubling Insiditabilization	y (Gal/Ft): le Diameter C Criteria Rang	0.75" = 0.02; apacity (Gal/Fi e: Specific C	1" = 0.04; t): 1/8" = 0.00; onductance: ± 6	1.25" = 0.06; 06; 3/16" = 0.0 5%; Dissolved	2" = 0.16; 3" = 0014; 1/4" = 0.0 d Oxygen: ± 0.2 r	= 0.37; 4" = 026; 5/16" = ( ng/L, or 10% sat			1.47; 12" = 5.88 0.010; 5/8" = 0. Turbidity: <10 N	
				FIELD	SCREENING	SUMMAR	Υ			
	d: Yes/No	Filter Size		cate: Yes/ No			Time		MS/MSD:	
VOIES: (	Sample Ana	lysis, Field S	creening Analy	ysis, Photogra	iph Information	, Rational for	Sample Metr	nod Used, V	Vell Observatio	ns/ Conditions.)
						e e				

## **SMOKEY MOUNTAIN SMELTERS**

**Knoxville, Knox County, Tennessee** 

## November 2013 Quarterly Event 2 Remedial Investigation / Feasibility Study

Groundwater Sampling Log
Book 2 of 3



MANAGING THE VISION® | ENVIRONMENTAL | FACILITIES | LOGISTICS

## Historic Purge and Well Information Fe+ 2 Results

	Screen	June 2013	August	Nov 2013			-
Well ID	Interval	DTW	2013 DTW	DTW	Purge time	Pump	Comment
0 <u>1</u> A	30-40	37	31.7		<1 hr	Sub	draws down
02A	17-27	14	14.96		<1 hr	Peris.	good recharge
03B	56-66	38	32.98		2-3 hr	Sub	draws down
04A	33-43	41	35.9		1-2 hr	Sub	draws down
07A	13-23	21	16.25		1.5-2 hr	Sub	dry
07B	30-40	23	17.83		1.5-4 hrs	Sub	slow
A80	25-35	26	22		1.7 hr	Sub	some
10A	22-32	18.5	25.1		1.5 hr	Peris.	slow
10B	60-70	29	23.3		1.5 hr	Sub	some
11A	15-30	3.6	5.7		1 hr	Peris.	good recharge
11B	41-56	5.9	7.7		0.5	Peris.	good recharge
12A	24-40	30.5	32.7		2.0 hr	Sub	some
12B	52-62	29.8	32.69		2-4 hr	Sub	good recharge
13A	20-30	20.1	28.6		2 hrs	Sub	slow or dry
13B	56-71	25	31.7		1.2 hr	Sub	slow

## **Groundwater Fe+2**

## Surface water Fe+2

•					
Fe+2	dilution?	Result	Fe+2	dilution?	Result
01A		.01	SW01		
02A			SW02		
03B			SW03		
04A			SW04		
07A			SW05		
07B			SW08		
08A			SW08 spring		
10A			SW09		
10B			SW09 spring		
11A		0	SW10		
11 <del>8</del>			SW11		
12A			SW12		
12B		231	SW13	•	
13A			SW14		
13B	v	.19	SW20		
			<del></del>		



## **INSTRUMENT AND CALIBRATION LOG**

## Site Name:

		inst	rument Re	adings			l		
Date	Parameter	Calibration Value		Bump Test Value	Time )	Signature	Instrument Type/Manufacturer	Serial Number	
11-10	ORP 241	200	8115					13078	Ду
	Dh~10	10	8:18						_]′
	1 m 4	4	8010			Sen	<u> 451                                   </u>		4
	11113	1413		<del>                                     </del>				<u> </u>	_
		·	<u> </u>	<u> </u>					}
S   1	1.43 CONE	A A	8:18		PROBLEM SALES OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY	The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s			-
11-13	<del>                                     </del>	1466	3 03		<u> </u>	ST	y 51	105038	$\dashv$
	7.0 Ph	747	<u> </u>	<del></del>					-
	240 200	1		<del>                                     </del>	<u> </u>				$\dashv$
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11-64	240 ORP	241				51	V(/	103050	
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SOCIATES, II	NC. ITAL I FACILITIÉS I L	OGISTICS	G	ROUND	WATER	SAMP	LING LO	OG		
SITE NAM	E: Smokey	Mountain Sr	nelter Site	SITE LOCA	TION: Knox	ville, Tennes	see		DATE: U	-12.13
WELL NO	11-A			SAMPLE II	D:			<u></u>	SAMPLE TIM	ME: 4:00
WEATHER	CONDITIO	NS/ GENER	AL OBSERVA	TIONS:						
		<u>-</u> -			PURGING I	DATA		_		
Well Type:			Pump: (S/N)						Total Well De	epth (feet):
Well Diam	eter (inches)	:	Water Qualit	どの ly Meter: (S/N	):				Screen Inten	val (feet) /5-30
( Tubing Dia	meter (inche	as):	して 1 つうん	7 %) ter (S/N):					/	ر د to Water (feet)
3/16ID x 0.	250D	,							84	15
Tubing Ma <b>PTFE</b> (Tef				Indicator: (S/I Lo 142	1):				Tubing Depth	(Begin/End)
1 WELL V	OLUME PUI			- Static Dept	h to Water) X ns/foot =	Well Capacit	y gallons			Purged (gallons):
Purge Met	hod: Traditio	onal Multiple	Volume Purge	("Sipping from	n the Top") or l	ow-Flow ("Tu	ubing in Mid S	Screen")	Total Volume	Purged (gallons):
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp.	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
8-43		(gai)	8,45	14186	1,4354	1,56	81.53	236,2	3120	
S.M	1,25	1,25	6.5	15,53	1,379	0.26	8,72	8135	401	
700	175	7.00	8.65	1567	1,345	0,01	8572	717.7	3,53	. ,
9605	ري	25	8,65	15.66	11307	0,15	C173	TIYS	364,	•
71/0	•6	311	8.65	6144	1.009	017	8,13	713.0	484	*.
175	165	3.75	8:70	15,70	1,274	0.16	6.23	2127	1,33	<u></u>
11.5	SAMO	4		_		-		_		
	<del></del>	-		1			<del> </del>	<del> </del>		
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•	,	<del>                                     </del>	7.					_		, ¢
		<del></del>								<del> </del>
	Tara .		•				<u> </u>			
Well Capac Tubing Insi Stabilization	de Diameter C	apacity (Gal/F	(t): 1/8" = 0.000	06; 3/16" = 0.0 5%; Dissolved	2" = 0.16; 3" = 014; 1/4" = 0.0 I Oxygen: ± 0.2 r	026; <b>5/16</b> " = ( ng/L or 10% sat	0.004; <b>3/8</b> " = turetion, <b>pH</b> :	0.006; 1/2" =	1.47; 12" = 5.88 0.010; 5/8" = 0. Turbidity: <10 N	.016
Field Filter	ed: Yes/No	Filter Siz		icate: Yes/No			Time		MS/MSD:	
NOTES:	(Sample Ana	alysis, Field S	Screening Analy	ysis, Photogra	ph Information	, Rational for	Sample Meti	nod Used, V	Vell Observatio	ns/ Conditions.)
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SITE NAME: Smol	key Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE:
WELL NO:	18	SAMPLE ID:	SAMPLE TIME: US 115
WEATHER COND	TIONS/ GENERAL OBSERVA	rions:	

	PUNGING DATA	H	
Well Type:	Pump: (S/N): 4423		Total Well Depth (feet):
Well Diameter (inches):	Water Quality Meter: (S/N):		Screen Interval (feet)
Tubing Diameter (inches):	Turbidity Meter: (S/N):	•	Static Depth to Water (feet)
3/16ID x 0.25OD	Water Level Indicator: (S/N):	į	
Tubing Material:	Water Level Indicator: (S/N):	[	Tubing Depth (Begin/End)
PTFE (Teffon)	903812		
1 WELL VOLUME PURGE = (To	otal Well Depth - Static Depth to Water) X Well		Volume to be Purged (gallons):
= ( feet -	feet) X gallons/foot =	gatlons	
Purge Method: Traditional Multiple	e Volume Purge ("Sipping from the Top") or Low-F	low ("Tubing in Mid Screen")	Total Volume Purged (gallons):

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
1205		-	37.65	15,74	2.675	3,40	7156	150.1		
1219	· S	2	37.76	15.63	7.651	092	7.06	1420	60	
1713	.75	.75	37,70	15,54	Well	0,96	6.59	140.4	3019 AU	·
1270	. 27	<b>6</b> 1	37170	16,74	297	<u>049</u>	6.56	140.7	1151 AU	
1223	or 5_ ∵	Tis	7.7	620	254	0.46	654	(39.L	753	
1275	109	1,75	37,70	1618	2,539	0-42	% C2.	138	631	
1235	<u>« 5</u> δ	2125	37.70			0.35	621	138	78	
1234	175	7.5	27.70	16.31	24%	051	6.80	1386	19	6 10 AV
1246	r (	30	37.7	1629	21572	527	6.79	135	19	
1245	2	3,5	37.7	16.25	2,302	3125	6178	1379	17_	
1250	15	Ú. A	27.7	1637	2,295	S. ZY	6,78	1376	42	
17.56	ίζ	MC	37.7	1613/	urs	020	6177	<u>'</u> [37_	10	<u> </u>
1300	١٢	63	3717	16.42	424	020	6.78	13715	3	

Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.86 Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range; Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU

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Field Filtered: Yes/No	Filter Size:	Duplicate: Yes/ No	Duplicate ID:	Time:	MS/MSD: Yes/ No
NOTES: (Sample Analys	is, Field Screening	Analysis, Photograph	Information, Rationa	al for Sample Method Used,	Well Observations/ Conditions.

SAMPLER(S) SIGNATURE:

Penskiner 51



**GROUNDWATER SAMPLING LOG** 

SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 11 17 3
WELL NO: 13B	SAMPLE ID:	SAMPLE TIME:
WEATHER CONDITIONS/ GENERAL OBSERVA		

_	PURGING DATA	
Well Type:	Pump: (S/N): 20879	Total Well Depth (feet):
Well Diameter (inches):	Water Quality Meter: (S/N):	Screen Interval (feet)
Tubing Diameter (inches):	Turbidity Meter: (S/N):	Static Depth to Water (feet)
3/16ID x 0.25OD	7000	
Tubing Material:	Water Level Indicator: (S/N):	Tubing Depth (Begin/End)
PTFE (Teflon)	A0381Z	
	al Well Depth - Static Depth to Water) X Well Capacity	Volume to be Purged (gallons):
= ( feet -	feet) X gallons/foot = gallons	
Purge Method: Traditional Multiple	Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	Total Volume Purged (gallons):

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
2145	-	Brighton,	3812	1450	777	3 511	747	101		RANGE
7.55	5	15	38,50	14,51	780	082	7,03	ZS1 8	<b>CAR</b> 3	64
320	, ζ	10	35,50	15.82	772	042	7.09	16.3	209	
3.05	رج.	trs	25.00	16.10	767	633	7.07	Sis	138	
310	15	7.0	36.50	16,02	767	.29	7103	815	108	
315	, <u>S</u>	1.5	38150	16.18	770	.76	7.00	2.5	121	
320	125	7.75	75,50	16 10	771	.25	6-98	23	9916	
325	. 25	3.0	38-50	16.15	770	.23	6.98	0.7	82	
330		3,5	35.50	16.06	771	122	6.96	-2	65	(
25	125	3175	35/	16.68	770	820	6.97	- 200	68	<u></u>
340	128	40	35.0	15,97	772	1998	6.95	-28	85	_
1346	, 21	yirs	38,50	15,99	772		6.94	-29	85	
3\$5	, رح	600	3800	15:85	771	<u>0, 18</u>	696	13.0	53	

Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU

#### FIELD SCREENING SUMMARY

Field Filtered: Yes/ No Filter Size:	Duplicate: Yes/ No	Duplicate ID:	Time:	MS/MSD: Yes/ No
NOTES: (Sample Analysis, Field Screening	Analysis, Photograph		or Sample Method Used,	
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RADING THE VISION P ENVIRONMENTAL   FACILITIES   LOGISTICS	ROUNDWATER SAMPLING LOG	<del></del>
SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE:
WELL NO:	SAMPLE ID:	SAMPLE TIME: YING
WEATHER CONDITIONS/ GENERAL OBSERVA	TIONS:	

	PURGING DATA	
Well Type:	Pump: (S/N):	Total Well Depth (feet):
Well Diameter (inches):	Water Quality Meter: (S/N):	Screen Interval (feet)
Tubing Diameter (inches): 3/16ID x 0.25OD	Turbidity Meter: (S/N):	Static Depth to Water (feet)
Tubing Material: PTFE (Teflon)	Water Level Indicator: (S/N):	Tubing Depth (Begin/End)
1 WELL VOLUME PURGE = (T = ( feet -	otal Well Depth - Static Depth to Water) X Well Capacity feet) X gallons/foot = gallons	Volume to be Purged (gallons):
		Total Valuma Burgad (gallona):

Purge Method: Traditional Multiple Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
355	81,3	4.75	3815	15,80	775	0.17	6.93	-3.3	5719	
400	125	5 00	3815	16.07	774	-15.	6.93	-26	3312	
405	.25	5.25	345	16.08	774	./U	293	-2.1	てりて	
410	,25	5,50	2815	1606	774	17	6.93	-1.2	916	
VIS	25,	5,75	35.5	16.00	776	212	692	40	9.9	
420	.25	6.0	36.5	(1,0)	778	111	6.92	113	816	
475	125	6.0	2615	16.06	7.80	• [ [	691	2.2	826	. <u></u>
430	15	625	3545	16.08	75(	.12	691	1,1	818	
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Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.66; 5" = 1.02; 6" = 1.47; 12" = 5.88

Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.016; 5/8" = 0.016

Stabilization Criteria Range: Specific Conductance: ±5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU

#### **FIELD SCREENING SUMMARY**

	Field Filtered	Ves/Ne	Filter Circs	Duplicate:	Voo/No	Dumlianta II	·	Time:		MC/MCD.	Van/No	
ĺ	Field Filtered:					Duplicate II			الملقة الممالة	MS/MSD:		- >
I	NOTES. (Sal	mple Analys	sis, Field Screening	Analysis, Fi	notograpii i	imormation, i	nationalitor	Sample Metrio	i Osea, wei	Observatio	ris/ Condition	is.)
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SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: UT 2
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WELL NO: /~ / う	SAMPLE ID:	SAMPLE TIME: ' Y
WEATHER CONDITIONS/ GENERAL OBSERVA	TIONS:	

•	PURGING DATA					
Well Type: 2	Pump: (S/N):	Total Well Depth (feet): 25				
Well Diameter (inches):	Screen Interval (feet)					
Tubing Diameter (inches): 3/16ID x 0.25OD						
Tubing Material: PTFE (Teflon)	` '					
1 WELL VOLUME PURGE = (	Total Well Depth Static Depth to Water) X Well Capacity  feet) X gallons/foot = gallons	Volume to be Purged (gallons):				
Purge Method: Traditional Multi	ple Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	Total Volume Purged (gallons):				

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
845	i	-	19.45	13			-			
850	<i>a</i> 3	,3	1965	13,74	497	445	6115	721	012	
855	, 3	16	19.65	16.71	5	687	6.18	714	339	
902	Ŋ	, ca	19.65	1701	616	60	615	212	196	
907	3	1,2	19.65	7.0%	7.24	.34	6.79	710	181	
915	.4	1.6	19,70	1-16	5,30	026	(,73	709	170	
923	٠\$.	7,5	19,70	1807	5,35	22	(15)	208	90	
930	iS	3,0	19170	1000	5/112	26	(30)	207	47,2	}
935	_ گ_	3,5	19,70	16.21	5,45	.21	3,37	207	3611	
940	\$	5.8	19,70	16,70	SUS	121	6,32	207	34,2	
949	. 87	9.4	19,70	17.19	5.51	, 17	6.34	206	28.9	-
10,00	18	5,2	19170	17.31	5,56	116	636	205	20.5	
1010	. 8	6,0	19,70	17,52	5,67	13.	6.35	zoul	1818	

Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU

#### FIELD SCREENING SUMMARY

L	Field Filtered:			Duplicate:		Duplicate		Time:	MS/MSD: Yes	
I	NOTES: (Sa	mple Analys	is, Field Screening	Analysis,	Photograph	Information,	Rational for Samp	ole Method Used, Wel	Observations/ C	onditions.)
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SAMPLER(S) SIGNATURE:



SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: (1-13, 3
WELL NO: 7-13	SAMPLE ID:	SAMPLE TIME: 1740
WEATHER CONDITIONS/ GENERAL OBSERVA	TIONS:	

	Water Quality Meter: (S/N):  Screen Interval (feet)  Static Depth to Water (feet)  Turbidity Meter. (S/N):  Static Depth to Water (feet)  Tubing Depth (Begin/End)  Water Level Indicator: (S/N):  Tubing Depth (Begin/End)  Well Capacity  feet - feet) X gallons/foot = gallons  Total Volume to be Purged (gallons):  Total Volume Purged (gallons):		
Well Type:	Pump: (S/N):	Total Well Depth (feet):	
Well Diameter (inches):	Water Quality Meter: (S/N):	Screen Interval (feet)	
Tubing Diameter (inches):	Turbidity Meter. (S/N):	Static Depth to Water (feet)	
Tubing Material: PTFE (Teflon)	Water Level Indicator: (S/N):	Tubing Depth (Begin/End)	
		Volume to be Purged (gallons):	
	Solume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	Total Volume Purged (gallons):	

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
1015	, 5	613	19,70	7.4	5159	212	6,38	204	131	
1070	15	7,0	19,70	17,33	5,80	012	6139	2041		
1030	13	7.3	19.70	17.31	5.62	,17	6139	ZOU	8,4	
1035	13	76	19170	17.26	5,62	112	6139	204	8,0	
1240				17.27	562	112_	6,39	704	Q &	
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<b> -</b>			<del> </del>		<u> </u>	<u> </u>	-	<del>  -</del>		<u> </u>
					<u></u>					

Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU

#### FIELD SCREENING SUMMARY

Field Filtered:		Filter Size:	Duplicate:	Yes/ No	Duplicate I		Time:	MS/MSD:	
NOTES: (Sar	nple Analy	sis, Field Screening	j Analysis, F	hotograph	Information,	Rational for	r Sample Method Used, W	all Observation	ns/ Conditions.)
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SAMPLER(S)	SIGNATU	RE: , //		7					



#### **GROUNDWATER SAMPLING LOG**

HANAGING THE VIS	SION   ENVIRONMENTAL   FACILITIÉS   LOGISTICS	ROUNDWATER SAMPLING LOC	<u> </u>
	SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 11-13-13
	WELL NO: 7 A	SAMPLE ID:	SAMPLE TIME: 335
	WEATHER CONDITIONS/ GENERAL OBSERVA	TIONS:	

	PURGING DATA	
Well Type:	Pump: (S/N):	Total Well Depth (feet): 6
Well Diameter (inches):	Water Quality Meter: (S/N):	Screen Interval (feet)
Tubing Diameter (inches): 3/16ID x 0.25OD	Turbidity Meter: (S/N):	Static Depth to Water (feet)
Tubing Material: PTFE (Teflon)	Water Level Indicator: (S/N):	Tubing Depth (Begin/End)
1 WELL VOLUME PURGE = (To	otal Well Depth - Static Depth to Water) X Well Capacity	Volume to be Purged (gallons):
= ( feet	feet) X gallons/foot = gallons	(gamena)
Burge Method: Traditional Multipl	o Volumo Burge ("Singing from the Ten") or Low-Flow ("Tubing in Mid Sergen")	Total Volume Purged (gallons):

_	, ,									
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
1300			70.9			4			·	
12:05	,3	.3	209	16.87	10.031	.60	6.06,	2681	503	
12.10	ر ا	16	21,4	17,00	9,980		6.06	2881	477	
12115	3	,9	71.55	ない	9,84	- 56	6.07	2083	415	·
1220	13	1.2	2150	17.19	9.61	. 16	GIVI	706	17	
1725	.3	1.7	2150	17.41	960	.17	5.75	260	60.91	
1230	, 4	2.1	21,45	1734	9.53	11	613	705	44,0	
1235	. <b>\$</b>	26	71.50	17.33	9.50	10	614	705	26:2	
1240	14	3	2150	17.33	9,48	.09	6121	roy	190	
1275	·\$	3,5	2150	17.25	4:42	.07	G, 13	203	1119	
1250	ر <u>ح</u> '	40	71.50	17.26	9,41	-07	613	203	9,33	
1255	•5	4.5	21,50	17:27	9,39	.07	G13	203	コワ)	
1300	٠,5	5.0	21:50	17.28	9.38	.07	G13	203	6145	

 Well Capacity (Gal/Ft):
 0.75" = 0.02;
 1" = 0.04;
 1.25" = 0.06;
 2" = 0.16;
 3" = 0.37;
 4" = 0.65;
 5" = 1.02;
 6" = 1.47;
 12" = 5.88 

 Unbing inside Diameter Capacity (Gal/Ft):
 1/8" = 0.0006;
 3/16" = 0.0014;
 1/4" = 0.0026;
 5/16" = 0.004;
 3/8" = 0.006;
 1/2" = 0.010;
 5/8" = 0.016 

 Stabilization Criteria Range:
 Specific Conductance:  $\pm 5\%$ ;
 Dissolved Oxygen:  $\pm 0.2$  mg/L or 10% saturation,
 pH:  $\pm 0.1$  unit;
 Turbidity: <10 NTU</td>

#### FIELD SCREENING SUMMARY

Field Filtered: Yes/ No Filter Size:	Duplicate: Yes/ No	Duplicate ID:	Time:	MS/MSD: Yes/ No
NOTES: (Sample Analysis, Field Screening	g Analysis, Photograph	Information, Rational	for Sample Method Used, Wel	l Observations/ Conditions.)
			•	
			·	*
·			•	
	4			
	•			

1 2 4 5 6 7 8 9 10 11 12 13 14 5 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31  Volume total DTW femplor DD Ph 0 RP JURB  Time Prace prace  Type - 35/115	
Time preged press	1
14.0 35.45	1
14.0 35.145	1
	T.
1405 , 30 ,30 38,00/796 10.82 .62 5,30 157. 598	
1410 1,45 1.75 139,10 18,14 10,69 .26 8,61 11340 467	
1415 .30 1.05 375018118 105 .25 5,64 1504 346	A
1420 1.40 1.453907 17.95 10.62 .20 8.61 MUS.6 716	parties of
1925 ,30 1.7539.8 18.16 10.65 016 5.60 143.2 173	7
(430 1.25 7.0 NO.D 18,71 10,61 -13 B.61 139-0) 105	profession of the second
(435 39 230 40,55 18,79 10,52 11 5,63 136.1 78,3	
1490 .30 2.9041.2018.72 1663 .09 5,61 132.9 61.0	
1415 . 30 310 41.40 18.68 10.57 .08 5.60 130.8 47.5	The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s
1450 130 350 416 (xi87 110:61), DS 15:59 1291 13527	
1455 130 3,80 41.8 18,73 6.6 .07 5,69 126,3 18.0	!
1500 -30 4,10 4210 18,79 10,63,07 5,62 1242 11,2	
1505 ,30 4,40 47.0 1858 10.65.07 5,59 122.9 9.1	
1510 130 4270 42.10 15.69 10.64.069 5.59 122.6 915	,
1529 130 5.00 12.15 18,79 10.65 .66 1560 1215 8.8	
	1
1525 130 5.60 42,2018,72 10/8 10 1556 119,9 9,4	!
1538 130 8,90 17229 1674 10.65 36 1569 1167 13.6	
1530 620 4220 1875 1067 .06 8.55 116.8 8.98	
130 6.80 1220 1860 10.69 05 5.59 119,7 137	
1550 130 170.40 170.40 1807 1003 8059 11512 1122	
1555 130 115 126 18,69 16,73 65 558 1129 1180	39
1600 30 7.8 42.7 Kebe 10.75 .05 559 111.7 4195	
1605 30 811 42.7, 1852 10.75 .05 559 109,9 5110	
1610 130 814 427 18-63 10.75 .05 5,59 110.3 6187	
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1025	:4	1.6 36.6 17.67 4.69 .78 6.45 146 543	
1030	14	7.0 36.6 17.74 4.73 .29 6.44 146,5 394	
	, Y	7.4 36.6 17.77 4.82 .24 6.45 146.7 286	
(o yo	14	2.8 36.8 M.75 492 58. 6.46 146 234	
(045	(	3.2 37.0 17.79 491 .23 6W4 146 199	
1050	,4	3.6 37.0 18:41 (1.99 -33 6.41 147 180	
1055_	14	400 13711 18102 498 187 643 146 116	
1000	1,9	44 37,2 17.96 4.96 .17 6.43 146 97,1	
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1110	, 4	5,2 373 1797 499 -12 644 145 13.0	
1115	17	5.5 37.4 18025.00 ·11 C.44 145 70.2	
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1130	14	6.7 37.418.085.11 10 6.42 145 46.1	
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### **SMOKEY MOUNTAIN SMELTERS**

**Knoxville, Knox County, Tennessee** 

November 2013

Quarterly Event 2

Remedial Investigation / Feasibility Study

Surface Water Sampling Log
Book 3 of 3



MANAGING THE VISION® | ENVIRONMENTAL | FACILITIES | LOGISTICS



## **INSTRUMENT AND CALIBRATION LOG**

Site Name: SMS

		Instr	ument Re	adings					
		Calibration		Bump Test				Instrument	
Date	Parameter	Value	Time	Value .	Time	₹ Sigi	nature	Type/Manufacturer	Serial Number
11 12 13	Specific Confed	+17.4-31	736	بصيد					
	oH	4.0							
	1.5								
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**SURFACE WATER SAMPLING LOG** 

SITE LOCATION: Knoxville, Tennessee SITE NAME: Smokey Mountain Smelters SMSSW20 SAMPLE TIME: pH (standar d units) Dissolved ms/gr or ORP Turbidity Temp. (°C) Oxygen (mg/L) Fe (capsule) Time (mV) (NTU) Range: .431 850 10.62 Result: ハル Stream depth: Stream width: Stream Flow rate: Filter_Size: Duplicate: Yes/No Duplicate ID: MS/MSD: Yes/ No Field Filtered: Yes/No SAMPLER(S) SIGNATURE: Creek Embayn Notes:

SITE NAM	IE: Smokey	Mountain Sr	melters	SITE LOCAT	ION:_Kno	xville, Tennessee		DATE: 11 12/13
SAMPLE	_{ID:} 5↑	1.04		· .				SAMPLE TIME: / #2
Time	Temp.	Specific Conductan ce 11s/Cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)	•••	(capsule)
142	8.76	4.178	4-03	7.04	-54.}	5.53		Range :
Stream Flo				ım width:		Stream depth:	<u> </u>	
Field Filter	red: Yes/ No	Filte <u>r Siz</u>	ze: Dup	licate: Yes/No	Duplicat	e ID:	Time:	MS/MSD: Yes/ No
SAMPLE	R(S) SIGNA	TURE	D	-	<u> </u>	· <del></del> _	No. 1	
Notes:								

		Mountain Sn		SHE LOCA	IION: Kno	cville, Tennesse	j	DATE: 2
Time	Temp.	Specific Conductan ce (18/Cm)	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)	<del></del>	Fe (capsule)
22	w c2		8.5	7.99	81			Range :
3	DI	1.728	D. 2	7.11	01			Result:
Stream Fl	•	<u> </u>	Strea	m_width:		Stream depth	1:	
Field Filte	red: Yes/No	Filter Siz	e: Dupl	icate: Ye <u>s/ N</u> o	Duplicat	e <u>ID:</u>	Time:	MS/MSD: Yes/ No

Notes:

SURFACE WATER SAMPLING LOG SION | ENVIRONMENTAL | FACILITIES | LOGISTICS SITE LOCATION: Knoxville, Tennessee SITE NAME: Smokey Mountain Smelters SAMPLE TI Specific Conductan pH (standard Dissolved **Turbidity** Temp. (°C) ORP Fe (capsule) Time Oxygen (mg/L) (NTU) ce ms/cm (mV) units) or uS/cm Range: Result: Stream depth: Stream Flow rate: Stream width: MS/MSD: Yes/ No Field Filtered: Yes/ No Filter Size: Duplicate: Yes/No Duplicate ID: Time: SAMPLER(S) SIGNATURE: Notes: SITE LOCATION: Knoxville, Tennessee SITE NAME: Smokey Mountain Smelters SAMPLE ID: SMS SW DE SAMPLE TÎME: Specific Dissolved Нq Turbidity Temp (°C) ORP (Standard Time Oxygen Fe (capsule) ce ns/cm (mV) (NTU) (j.) (mg/L) units) Range: DIS . 🗓 Result: Stream width: Stream Flow rate: Stream_depth: Field Filtered: Yes/No Filter Size: Duplicate: Yes/No Duplicate ID: Time: MS/MSD: Yes/ No SAMPLER(S) SIGNATURE: Notes: SITE LOCATION: Knoxville, Tennessee SITE NAME: Smokey Mountain Smelters Specific Dissolved pΗ Turbidity ORP Temp. (°C) Time (standard Oxygen Fe (capsule) ce ms/cm (NTU) (mV) units) (mg/L) or µS/cm Range:

Result: Stream width: Stream Flow rate: Stream depth: Duplicate: Yes/ No Duplicate ID: Field Filtered: Yes/ No Filter Size: Time: MS/MSD: Yes/ No SAMPLER(S) SIGNATURE:

Notes:

(

SITE NAM		Mountain Smelte 155W		SITE LOCA	TION: Kno	oxville, Tenness	see		DATE: 4
Time	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)			Ferrous Iron (Field Test
									Range :
15	7.20	0.270	7.5	7 8.	78.	<b>T</b>		F	Result:
Stream Flo	w rate:		Stream v	vidth:		Stream depth:			
ield Filter	ed: Yes/No	Filter Size: _	_ Duplicat	e: Yes/No	Duplicate	ID:	Time:		MS/MSD: Yes/ No
AMPI FE	(S) SIGNATI	IRF:							
	i(o) oldinari								

	IE: Smokey	Mountain Smelt	ers	SITE LOCATION: Knoxviile, Tennessee					DATE: 11 13 13 SAMPLE TIME: 1330				_
Time	Temp.	Specific Conductance ms/crit or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)			Fe	(caps	sule)	<b>=</b>	
1515	10:36	-836	8.61	7.89	103.6			Range:					
Stream Fig	<u> </u>		Stream	L	<u> </u>	Stream dept	h:	1 1	esult:				
	red: Yes/No	Filter Size:		e: Yes/No	Duplicate		Time:		MS/MSD	Yes/	No		
SAMPLER	R(S) SIGNAT	URE:											

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Notes:

SITE NAM	6.	Mountain Sn	neiters	SITE LOCA	TION: Knox	ville, Tennes	See	DATE: 13/13
Time	Temp.	Specific Conductor ce 18/cp or µs/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)		Fe (capsule)
11151	2 9 8	(29	10.14	2 33	92.6			Range :
1421	0.10	.34	10 1	1. 55	12.0	<u></u>		Result:
Stream Flo	ow rate:	<del></del>	Stream	m width:		Stream de	oth:	
Field Fifter	red: Yes/No	Filter Siz	e:Dupli	cate: Yes/No	Duplicate	ID:	Time:	MS/MSD: Yes/ No
SAMPLE	R(S) SIGNAT	URE:						

Notes:

SITE NAM	IE: Smokey	Mountain Sm	elters	SITE LO	CATION: Kn	oxville, Tennes	see_	DATE: 11/13/13
SAMPLE	· ·	114						SAMPLE TIME: 142-0
Time	Temp. (°C)	Specific Conductance ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)		Ferrous Iron (Field Test)
1509	8.06	0.774	8.74	7.85	98.2	. [		Range :
Stream Flo			Stream	width:	_	Stream depth		
	ed: Yes/ No	Filter Size		ate: Yes/No	Duplicate		Time:	MS/MSD: Yes/ No
	(S) SIGNA							
Notes:					-			•
SITE NAM	E: Smokey	Mountain Sme	elters	SITE LOC	ATION: Kno	oxville, Tenness	see	DATE: 11/13/13
SAMPLE I	D: 54	103						SAMPLE TIME: 150
Time	Temp. (°C)	Specific Conductanc e ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standar d units)	ORP (mV)	Turbidity (NTU)		Fe (capsule)
ر ارسی			11.00	1220	1222			Range :
1545	6.59	1.493	4.92	7.75	122.5			Result:
Stream Flo	w rate:		Stream	width:		Stream depth:		
ield Filter	ed: Yes/No	Filter Size:	Duplica	te: Yes/No	Duplicate	ID:	Time:	MS/MSD: Yes/ No
SAMPLER	(S) SIGNAT	rure:		<del></del>	<del></del>	<u> </u>	<del></del> ,.	
	<del></del>							
Notes:								•
	•			(-		-		
<del></del>	<del>_</del>					<u> </u>		<del></del> _
SITE NAM	E: Smokey	Mountain Sme	elters	SITE LOCAT	ION: Knoxv	ille, Tennessee		DATE:
SAMPLE (	<u>D:</u>					·	-	SAMPLE TIME:
		Specific	Dissolved	Нq				
Time	Temp. (°C)	ce ms/cm		(standard units)	ORP (mV)	Turbidity (NTU)		Fe (capsule)
		or μS/cm						Range :
								Result:
				· · · · · ·				l

Notes:

SAMPLER(S) SIGNATURE:

#### **SMOKEY MOUNTAIN SMELTERS**

**Knoxville, Knox County, Tennessee** 

# March 2014 Quarterly Event 3 Remedial Investigation / Feasibility Study

Groundwater Sampling Log
Book 1 of 3



MANAGING THE VISION® | ENVIRONMENTAL | FACILITIES | LOGISTICS



#### **CALIBRATION LOG**

Site Name:

Date	Parameter	Initial Reading	Calibration Response	Verification Response	Time	End of Day Check	Time	Instrument Manufacturer	Serial Number	Calibration Standard Lot #/ Expiration	Signature
Biotist	D000	169 J	100		0741	7101	7657	YS1550	000008	62005 1	enal
	Carol.	1.477	1,413		0344	1.415	house			230425	10
	OHITO	7.28	7.00		0748	7.110	1652			230425	
	bH4.0	2,98	4.00		OTHE	4.21	1655			01/871	
	DRP	Lou 12	A40.0		07951	218.8	lote			01/871	
3/5/4	are 1	e boot	1.0	inst	unit	calify	TEN MAN	(HAC)	<u> </u>		
							L				<u> </u>
	<u> </u>			· <del></del>		<u></u>	 				
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Each instrument will be calibrated using calibration standards provided by the manufacturer or instrument vendorat the beginning of each work day, after battery replacement during each work day, after sensor maintenance during each work day, and after a failed calibration verification. Calibration consists of stabilization and electronic "spanning" of the instrument/sensor resposne to the calibration standard set via instrument software and manufacturer's instructions. Calibration verification consists of stabilization of the instrument/sensor with the calibration standard set to verify response within +/-10% of the calibration standard set value. Calibration verification will be performed immediately following calibration, at the end of each instrument use period (ie before turning the instrument off), at initiation of instrument use after restarting (ie after turning the instrument on after a shutdown during the work day), at any time during the work period when instrument readings are suspect, and at any time directed by the FOL. Include the unit of measure, i.e. "mV", "S.U.", "NTU", etc. in the calibration value column. THE FOL WILL REVIEW THIS CALIBRATION LOG AND COMPLETE THE FORM WITH HIS/HER SIGNATURE AT THE END OF EACH WORK DAY.

FOL Name:	*	
I OLIMANIC.		

FOL Signature:

VISION") ENVIRONME	SIGN'! ENVIRONMENTAL! FACILITIÉS   LOGISTICS GROUNDWATER SAMPLING LOG											
SITE NAM	E: Smokey	Mountain Sr	nelter Site	SITE LOCA	ATION: Knox	ville, Tennes	see		DATE: 3/	4/14		
WELL NO	.SMSM	4071	<b>-</b>	SAMPLE II	o: SMS	FOUN	H		SAMPLE TII	SAMPLE TIME: 0940		
WEATHER CONDITIONS/ GENERAL OBSERVATIONS: (Loudy 130'S   Swift Breeze												
PURGING DATA												
Well Type: 	Well Type: PVC Pump: (S/N): GEOSUB									Total Well Depth (feet):		
Well Diameter (inches): 2 1. Water Quality Meter: (S/N): 155 MP5 023520 Screen Inten									val (feet)			
Tubing Dia <b>3/16ID</b> x <b>0</b> .	meter (inche	s):	Turbidity Met	er: (S/N):	HACH 210	ω Q			Static Depth	to Water (feet)		
Tubing Ma	tenai:	3/16"	Water Level	Indicator: (S/I	N):				Tubing Dept	/ <b>y. 65</b> h (Begin/End)		
1 WELL V	OLUME PUF feet		al Well Depth feet) X		h to Water) X ens/foot =		y gallons			Purged (gallons):		
Purge Met	thod: Tradition	onal Multiple	Volume Purge	("Sipping fror	n the Top") or [	ow-Flow ("Tu	ubing in Mid S	Screen")	Total Volume	Purged (gallons):		
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm/or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation		
0243	0.5	0.5	14.96	15.32	46.60	2.20	6.13	779	>2000			
0856	/.0	1.5	15.07	16.21	46.98	0.65	6.19	-5.7	256	/0./44.9		
0500	2.000		15.07	14.23	4700	0.52	6.21	-21. (	154	cloudy		
0905	250:	52.5	16.22	6.23	47.20	0.45	6.23	-26.3	99.3			
0110	0.5	2.0	74.96	15.96	48.01	6.47	6.26	-30.2	65.3			
69.7	0.5	3.5	14.56	15.62			6.28	-26.5	43.8	<u> </u>		
0926	0.5	4.0	14.93	15.05	47.79	0.38	6.28	-24.3	9.44			
0935	0.5	4.5	14.43	16.14	47.57	0.37	6.29	-29.7	7.19	-		
									<u>-</u>	<del>- ]</del>		
					<del></del> -					<del></del>		
	-											
	de Diameter C	apacity (Gal/Fi	; 1" = 0.04; t): 1/8" = 0.000 onductance: ± 5	6; 3/16" = 0.0	014; 1/4" = 0.0	026; 5/16" = 0		0.006; 1/2" =	1.47; <b>12</b> " = 5.88 0.010; <b>5/8</b> " = 0 <b>Turbidity</b> : <10	.016		
	•			FIELD	SCREENING	S SUMMAR	ΙΥ					
Field Filter	ed: Yes/No	) Filter Siz	e Dunii	cate: Yes/			Time		MS/MSD:	Yes/No		
NOTES:	(Sample Ana	lysis, Field S	creening Analy	sis, Photogra	ph Information	, Rational for			Vell Observation	ins/ Conditions.)		
										[		
						* .				ļ		
L												
SAMPLER	R(S) SIGNAT	URE:	<del></del>				<del></del>	<u> </u>				



**GROUNDWATER SAMPLING LOG** 

SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 3/4/13					
WELL NO: 5MSMW 07 B	SAMPLE ID:	SAMPLE TIME: // 52					
WEATHER CONDITIONS/ GENERAL OBSERVATIONS:							

PURGING DATA								
Well Type: PVC	Pump: (S/N): 620 50 B 024969	Total Well Depth (feet):						
Well Diameter (inches): 2 **	Water Quality Meter: (S/N): /SI 556 mes 023420	Screen Interval (feet)						
Tubing Diameter (inches): 3/16ID x 0.25OD	Turbidity Meter: (S/N): LHACH 2100 Q	Static Depth to Water (feet)						
Tubing Material:	Water Level Indicator: (S/N):	Tubing Depth (Begin/End)						
PTFE (Teflon)		~ 47.0						
1 WELL VOLUME PURGE = (Tole = (	tal Well Depth - Static Depth to Water) X Well Capacity feet) X gallons/foot = gallons	Volume to be Purged (gallons):						
Purge Method: Traditional Multiple	Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	Total Volume Purged (gallons):						

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
1031	0.5	0.5	16.95	15,89	99,90	0.91	5.04	-31.3	14.85	
1074	0.5	1.0	16.85	15.29	19.46	0.53	5.85		305	}
104.	0.5	1,5	16.71	16.17	98,64	0.39	5.37	-485	167	
1046	0.5	2.0	1671	16.11	98.15	0.15	5.83	-439	93.3	
1052	0.6	2.5	16.71	16.21	97.68	0.31	5.70	-47.1	814	
1958	0.5	<b>3.</b> 0	16.71	16.32	77.04	0.58	5.90	-457.1	71.7	
1105	0.5	3.5	16.71	16.26	96.26	0.26	5.91	-5/.5	45.7	
1///	0.5	4.0	16.71	16.19	96.57	0.26	5.71	-50.3	34.5	
147_	0.5	4.5	16.74	16.50	96.06	0.24	9.9Z	-53.0	31.7	i
1122	0.5	5.0	16.69	16.17	96.15	0.24	5.91	-52.1	26.3	
1130	0.5	5.5	16.68	16.07	95.99	024	2.91	-49.0	20.9	
1/49	1.5	7.0	16.66		15.72	0.23	5.71	-279	9.47	
				<u> </u>			<u></u>	}		

Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU

#### FIELD SCREENING SUMMARY

l			d: <u>Y</u> es				Duplicate		Duplicate			Time:	1	MS/MSD:		_
1	TON	ES: (	Sample	Analys	is, Fiel	d Screening	Analysis,	Photograph	Information	Rational fo	r Sample	Method	Used, Well	Observatio	ns/ Conditions.)	
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ITE NAM	IE: Smokey	Mountain Sr	neiter Site	SITE LOCA	TION: Knox	DATE: 3	15/14			
ELL NO	: SMS	SMWG	2A	SAMPLE I	o: it	SAMPLE TIN	AE.			
VEATHE	CONDITIO	NS/ GENER	AL OBSERVA	TIONS: 😞		eld	740		OAMELL III	· ·
<u> </u>					PURGING			dice		
Nell Type:	Flux	nound	Pump: (S/N)	902	204	periti	affic	sump	Total Well De	epth (feet): 27 (ff
	eter (inches)		Water Qualit	y Meter: (S/N)	YSI	0148		1		val (feet) 17-27
	meter (inché	es):	Turbidity Me	ter: (S/N):	ad 11	090001	2514		Static Depth	to Water (feet) 132
Tubing Ma	terial: 🖊		Water Level	Indicator: (S/N	v): Solins	1 20	1494		Tubing Depti	h (Begin/End)
= (	feet	-	al Well Depth feet) X	gallo	ns/foot =		gallons		<b>4</b> 7	Purged (gallons):
urge Me	thod: Traditi		Volume Purge	("Sipping fron		_ow-Flow ("T(	bing in Mid	screen")	<u></u>	
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance figs/cm ob µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
7:06	0.5	0.5	13.77	14.41	12.65	15.8	9.77	-31.6	24.0	brownish
7:17	0.5	1.0	13.85	14.94	12.75	Щ.3	9.78	-160.8	11.3	ii
<u>i 26</u>	0.5	15	13.83	14.99	12.79	8,4	4.78	-171,5	7.39	1( 4B
1.36	0.5	2.0	13.85	14.96	12.85	6.7	9.78	~214.4	7.81	11.
1:41 1:00	0.5	3.0	13.83	14.86	12.89	6.1	9,17	-230.g	2.50	si.
0:04	0.25	7.25	13.83	14.99	12.88	6.0	9,77	-233.5	2.34	ti
_ <del></del>		2.5.5		<del>                                     </del>	14.00		12.5	3.000		
	ļ	<u> </u>			 	 	<u> </u>	<u> </u>		
	<del></del>	<del></del>	<u> </u>		<del></del>	<u> </u>	<del></del>	<u> </u>		
		<del></del>			<del> </del>	<del></del>				
Vall Canac	ity (Gal/Ft):	0.75" - 0.00	?; 1" = 0.04;	1 25" - 0 00:	2" - 0.16; 2"	0.27: 4"-	0.65; 5"=	1.00: 6" -	1.47; <b>12</b> " = 5.88	<u></u>
ubing insi	de Diameter (	apacity (Gal/F	t): 1/8" = 0.000 Conductance: ± 5	3/16" = 0.0	014; 1/4" = 0.0	026; 5/16" = 0	0.004; 3/8" =	0.006; 1/2" =	0.010; <b>5/8</b> " = 0 Turbidity; <10 N	016
<del></del>	<u> </u>		<u> </u>		SCREENING	<del></del>	<del></del>	<del></del>		<del></del>
in a Cite		) Elle 0			<del></del>				NO MARIN	
	ed: Yes(No (Sample Ana			cate: Yes No /sis, Photográ			Time Sample Meti		MS/MSD: Vell Observation	ns/ Conditions.)
€										
			Andreas and the							

SITE NAME: Smokey Mountain Smelter Site SITE LOCATION: Knoxville, Tennessee DATE: 3/3/14

WELL NO: MW 10 B SAMPLE ID: 5-14-1-1 SM SMW 108 SAMPLE TIME: 1450

WEATHER CONDITIONS/ GENERAL OBSERVATIONS:

**PURGING DATA** 

	PURGING DATA	
Well Type: PV C	Pump: (S/N): Pine 20616 Gec Sub	Total Well Depth (feet):
Well Diameter (inches): 311	Water Quality Meter: (S/N): Pine OII371 YSI MPS 556	$1 \qquad \omega \cup \sigma \cap \omega$
Tubing Diameter (inches): 3/16ID x 0.25OD	Turbidity Meter: (S/N): Pine 21541 HACH 2100 Q	Static Depth to Water (feet)  Tubing Depth (Begin/End)
Tubing Material: PTFE (Teflon)	Water Level Indicator: (S/N): Pine 1969 Selinst	Tubing Depth (Begin/End)
	al Well Depth - Static Depth to Water) X Well Capacity	Volume to be Purged (gallons):
= ( feet -	feet) X gallons/foot = gallons  Volume Purge ("Sinning from the Top") or Low-Flow ("Tubing in Mid Screen")	Total Volume Purged (gallons):

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> _µS/om_	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
1346	0.5	0.5	17,30	14,86	1,525	9,3	6.54	104.4	OVRUG	& milky
1347	0.7	L 25	17,31	15.07	1,481	10.3	6,52	136.9	OVRNG	\$1 meky
1352	0.25	d. 50	17.34	15,08	1.465	8.6	6.53	139.0		\$ /claring
1355	'U. 25	1.75	17.26	14.82	1.471	5,9	6.53	138.4	89.5	& Claury
1400	0.50	2.25	17.35	1508	1.472	5.0	6,52	1366	47,4	& cleany
1406	0.50	3.75	17.30	14.88	1,477	4.3	6.52	138.4	26,2	1 / Cleams
1412	0.50	3.25	17,36	14,89	1.488	4.0	6.52	126.0	18,3	1 dear
1419	0.25	3,50	17.30	14,90	1,492	2,0	6.52	118,7	14.7	4/ Clear
1423	0,25	3.75	17.30	14.92	1493	2,0	6,51	118,0	12.4	of felean
1429	0. 25	4,00	17.30	14.97	1499	2,4	6.51	115,2	12.1	6 Clear
1435	0.25	4,25	17,30	15.00	1.511	0,6	6.51	114.7	10,3	6 / clear
			•						•	

 Well Capacity (Gal/Ft):
 0.75" = 0.02;
 1" = 0.04;
 1.25" = 0.06;
 2" = 0.16;
 3" = 0.37;
 4" = 0.65;
 5" = 1.02;
 6" = 1.47;
 12" = 5.88 

 Tubing inside Diameter Capacity (Gal/Ft):
 1/8" = 0.0006;
 3/16" = 0.0014;
 1/4" = 0.0026;
 5/16" = 0.004;
 3/8" = 0.006;
 1/2" = 0.016;
 5/8" = 0.016;
 5/16" = 0.004;
 3/8" = 0.006;
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#### FIELD SCREENING SUMMARY

Field Filtered: Yes/No Filter Size: Duplicate: Yes/No Duplicate ID: Time: MS/MSD: Yes/No NOTES: (Sample Analysis, Field Screening Analysis, Photograph Information, Rational for Sample Method Used, Well Observations/ Conditions.)

Took 45 minutes to fill/label bottles

SAMPLER(S) SIGNATURE:



G THE VISION   ENVIRONMENTAL   FACILITIES   LOGISTICS	ANGONDITA EN CAME ENGLEGA	r /						
SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 3/4/14						
WELL NO: MW 13 B	SAMPLE ID: SMS MW 13B	SAMPLE TIME: 1020						
WEATHER CONDITIONS/ GENERAL OBSERVATIONS:								

PURGING DATA							
Well Type: PVC	Pump: (S/N): Pine 02616 GeoSilb	Total Well Depth (feet): 71					
Well Diameter (inches): 2	Water Quality Meter: (S/N): fine O11877 YS1 556 MPS	Screen Interval (feet) 56-7/					
Tubing Diameter (inches): 3/16ID x 0.25OD	Turbidity Meter: (S/N): Prive 21541 HACH 2100 Q	Static Depth to Water (feet)  3.3.45 Hz  Tubing Depth (Begin/End)					
Tubing Material: PTFE (Teflon)	Water Level Indicator: (S/N): Prine 1969 Solinst						
		~66→63					
1 WELL VOLUME PURGE = (	Total Well Depth - Static Depth to Water) X Well Capacity	Volume to be Purged (gallons):					

feet) X

Volume to be Purged (gallons):

Purgs Method: Traditional Multiple Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")

Total Volume Purged (gallons):

				, . FI U				,			_
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> - <del>µS/cm</del>	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation	
0832	0,5	0.5	23,12	14.46	0.614	3,2	7.10	-22,9	185	1 slight on	
0838	0,5	1:0	23/1/	14,78	0.607	1,5	7,11	0,6	127	9 musy	K
0846	0.5	1.5	23.71	14.80	0.606	0,8	7,12	19.4	83.6	6 milky	I
0853	0,5	20	23.71	14,92	0,608	0.0	712	392	84,1	1 vilta	I
0900	0,5	2,5	23.71	14,97	0,610	0.0	7.11	80.9	86.4	\$ 151/4	1
0907	0.5	3.0	23.71	15.08	0.612	0,0	ZiI	82,2	79.4	9 Cleaning	l
0914	0,5	3,5	23,70	14,57	0.590	0.2	7.12	81,3	291	1 turbid	I
0921	0.5	4.0	23.69	14.50	0.590	0,6	7/2	69,4	/3/	6/51/14	ll
0929	0.5	4,5	23,70	14,85	0,599	0,0	7,12	73.1	52.8	Il clearing	
0936	0.5	5,0	23.70	14.83	0.602	0,0	7.11	75.6	40.0	of cleaning	
0943	0.5	5.5	23.70	14.84	0.605	0,0	7.10	78,0	23,8	1 clearing	1
0950	0,5	6.0	23.69	14.85	0.609	0.0	7.10	79.8	17.7	0/0	1
0 958	0,5	6.5	23.69	14,78	0,613	0.0	7,09	82.3	14,4	Ø 1/0	1

Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, 1 pH; ± 0.1 unit; Turbidity: <10 NTU

#### **FIELD SCREENING SUMMARY**

Field Filtered: Jeg No J Filter Size: Duplicate: Yes No Duplicate ID: Time: MS/MSD: Jeg No V NOTES: (Sample Analysis, Field Screening Analysis, Photograph Information, Rational for Sample Method Used, Well Observations/ Conditions.) * Moved pump intake up about 3 feet to try to get turbidity to decrease. Reading @ 0914 went up. 1005 0,5 7.0 23.70 14.93 0.619 0.0 7.09 \$1.3

SAMPLER(S) SIGNATURE:



GROUNDWATER SAMPLING LOG NAGING THE VISION I ENVIRONMENTAL! FACILITIES I LOGISTICS DATE: 3 SITE LOCATION: Knoxville, Tennessee SITE NAME: Smokey Mountain Smelter Site MW 13 SAMPLE ID: SMS MW 134 SAMPLE TIME: WEATHER CONDITIONS/ GENERAL OBSERVATIONS: **PURGING DATA** Total Well Depth (feet): 30 Pump: (S/N): Pine 02616 GeoSub Well Type: PVC Screen Interval (feet) 20-30 Water Quality Meter: (S/N): Pine 011871 YST 556 MPS Well Diameter (inches): 🥎 Turbidity Meter: (S/N): Pine 21541 HACH 21000 Tubing Diameter (inches): Static Depth to Water (feet) ZZ, 86 Tubing Depth (Begin/End) 3/16ID x 0.25OD V Water Level Indicator: (S/N): Pine 1969 Silinst Tubing Material: PTFE (Teflon) 1 WELL VOLUME PURGE = (Total Well Depth - Static Depth to Water) X Well Capacity Volume to be Purged (gallons): feet) X galions/foot Total Volume Purged (gallons): Purge Method: Traditional Multiple Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen") Specific Total Depth to Dissolved Volume Conductance ORP Volume Temp. Turbidity Odor/ Color Time **Purged** Water Oxygen (standard ms/cm or (°C) (NTUs) Purged (mV)Observation (feet) (mg/L) units) (gal -∠uS/em-> (gai) 0.25 0.25 23.25 13.36 1.58 a650 22 5.07 176.8 203 0.50 23.44 14.81 1.654 2.02 4.87 11 15,01 660 1209 0,75 23.65 4.83 <u> 23, 83</u> 14,99 66 T 1,50 (,0 1) 15,00 Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance:  $\pm 5\%$ ; Dissolved Oxygen:  $\pm 0.2$  mg/L or 10% saturation, pH:  $\pm 0.1$  unit; Turbidity: <10 NTU FIELD SCREENING SUMMARY Field Filtered: Yes No Duplicate: Yes/(No) Fifter Size: Duplicate ID: Time: MS/MSD: Yes No NOTES: (Sample Analysis, Field Screening Analysis, Photograph Information, Rational for Sample Method Used, Well Observations/ Conditions.) S Hex Cr

Page 3 of 8



SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 3-5-14						
WELL NO: MW3B	SAMPLE ID: SMS MW3B	SAMPLE TIME: 1045						
WEATHER CONDITIONS/ GENERAL OBSERVATIONS:								

ΡI	UR	GIN	IG	DA	T/

Well Type: PVC	Pump: (S/N): Pine 02616 Geo Sab	Total Well Depth (feet): 66
Well Diameter (inches): 2	Water Quality Meter: (S/N): Pine 011871 YSI 556 MPS	Screen Interval (feet)
Tubing Diameter (inches): 3/16ID x 0.250D	Turbidity Meter: (S/N): Pine 21541 HACH 2160Q	Static Depth to Water (feet)
Tubing Material: PTFE (Teflon)	Water Level Indicator: (S/N): Pine 1969 Selinst	Tubing Depth (Begin/End)  ~ 60
1 WELL VOLUME PURGE = (To	tal Well Depth — Static Depth to Water) X Well Capacity	Volume to be Purged (gallons):
= ( feet -	feet) X gallons/foot ≈ gallons	
Purce Method: Traditional Multiple	Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	Total Volume Purged (gallons):

Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm/or ps/em-	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
0,25	0,25	33,85	14.35	115.9	0.85	5,47	60,8	OVRNO	\$ /silty
0,50	0.15	34,15	14.73	115.5	0.37	5.48	66.0	268	r r n
0. 25	1.00	34.55	15,84	114.8	0,34	5,49	30.6	144	l i
0.25	1.as	34.91	15,39	114,5	0.39	5.49	51.1	114	4
0.50	1.75	35.85	17.15	113.2	0,32	5,50	71.8	72.8	1/
0.50	2.25	36.25	16.93	112.8	0.27	5.51	43,8	53,5	7. 76
0,50	2,75	36,28	16.86	112,6	0,28	5.51	36,2	31,7	1 Clear
0.50	3,25	36.35	16.84	113.2	0,25	5,51	35,8	22,630	18.5
-0.25	3.50	36.30	16.92	112.9	0-24	5.52	59.3		& Iclean
0.25	3.75	36,30	16.93	112.9	0.24	5.51	64.4	10.1	& Illean
	Purged (gal O, 25 O, 50 O, 25 O, 50 O, 50 O, 50 O, 50 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 25 O, 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50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O,	Volume Purged (gal)  O, 25  O, 25  O, 25  O, 25  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 35  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O, 50  O,	Volume Purged (gal)         Volume Purged (gal)         Depth to Water (feet)         Temp. (°C)         Conductance (ms/cm)or (mg/L)         Dissolved Oxygen (mg/L)           0, 25         0, 25         33.85         /4.35         115.9         0.85           0, 50         0.15         34.15         14.73         115.5         0.37           0, 25         1.00         34.55         15.84         114.8         0.34           0.25         1.25         34.91         15.39         114.5         0.39           0.50         1.75         35.85         17.15         113.2         0.32           0.50         2.25         36.25         16.86         112.8         0.27           0.50         3.25         36.28         16.86         112.6         0.28           0.50         3.25         36.35         16.84         113.2         0.25           0.50         3.50         36.30         16.92         12.9         0.24	Volume Purged (gal)         Volume (gal)         Depth to Water (feet)         Temp. (°C)         Conductance ms/cm/or (ms/cm)or (mg/L)         Dissolved Oxygen (mg/L)         Standard units)           0, 25         0, 25         33.85         /4.35         115.9         0.85         5.47           0, 50         0.15         34./5         /4.73         115.5         0.37         5.48           0, 25         1.25         34.91          5.84          14.8         0.34         5.49           0.50         1.75         35.85          7.15          13.2         0.32         5.50           0.50         2.25         36.25          6.86          12.6         0.28         5.51           0.50         3.25         36.35          6.84          13.2         0.25         5.51           0.50         3.25         36.35          6.84          12.9         0.24         5.52	Volume Purged (gal)  0, 25  0, 25  0, 25  0, 35  1, 35  14, 35  115, 9  0, 85  0, 37  5, 48  66, 0  0, 35  1, 35  34, 15  14, 73  115, 5  0, 37  5, 48  66, 0  0, 35  1, 35  34, 91  15, 39  114, 5  0, 34  5, 49  30, 6  0, 50  1, 75  35, 85  17, 15  113, 2  0, 32  5, 50  71, 8  0, 50  2, 25  36, 25  16, 84  112, 6  0, 28  5, 51  36, 28  0, 50  3, 25  36, 35  16, 84  113, 2  0, 28  5, 51  36, 28  0, 50  3, 25  36, 35  16, 84  113, 2  0, 28  5, 51  36, 28  0, 50  3, 25  36, 35  16, 84  113, 2  0, 28  5, 51  36, 28  0, 50  3, 25  36, 36  16, 84  113, 2  0, 24  5, 51  36, 2	Volume Purged (gal)  0, 25  0, 25  0, 25  0, 35  0, 35  1, 35  1, 4, 35  1, 15, 5  0, 37  0, 37  1, 25  34, 15  14, 73  115, 5  0, 37  5, 48  66, 0  268  0, 35  1, 25  34, 91  15, 39  114, 5  0, 34  5, 49  30, 6  144  0, 50  1, 75  35, 85  17, 15  113, 2  0, 32  5, 50  71, 8  72, 8  0, 50  2, 25  36, 28  16, 86  112, 6  0, 25  3, 25  36, 38  16, 84  113, 2  0, 25  5, 51  36, 28  16, 86  112, 6  0, 28  5, 51  36, 28  22, 43  22, 43  0, 25  36, 38  16, 84  113, 2  0, 25  5, 51  36, 28  16, 84  113, 2  0, 25  5, 51  36, 28  22, 43  0, 25  0, 25  36, 36  16, 84  113, 2  0, 25  5, 51  36, 28  16, 84  113, 2  0, 25  5, 51  36, 28  16, 84  113, 2  0, 25  5, 51  36, 28  16, 84  113, 2  0, 25  5, 51  36, 25  16, 84  113, 2  0, 25  5, 51  36, 25  16, 84  113, 2  0, 24  5, 52  59, 3  16, 16

Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.05; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

Tubing Inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU

#### FIELD SCREENING SUMMARY

ł	Field Filtered:	Yes/	No/	Filter Size:	Duplicate	: Yes/[No	Duplicate	<u>ID:</u>	Time:	_	MS/MSD: Yes/No	
	NOTES: (Sar	mple /	Analysis	s, Field Screenin	g Analysis,	Photograp	h information	, Rational fo	or Sample Method	Used, Wel	Observations/ Condition	ons.)
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SAMPLER(S) SIGNATURE:	Illuka	
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SITE NAME	: Smokey	Mountain Sn	nelter Site	SITE LOCA	TION: Knox	ille, Tennes	see		DATE: 3	15/14	
WELL NO:	MW	DIA		SAMPLE II	: SM.	SMW	21A		SAMPLE TIM	ME: 1435	
			AL OBSERVA	TIONS:		_,ı					
					PURGING I	DATA					
Well Type:	PV	, C	Pump: (S/N)	Pine	02616	Geo	Sub		Total Well Depth (feet):		
Well Diamet	•	_	Water Quali	ty Meter: (S/N)	Dine A	11811	VCT E	560	Screen Inter	() (al (feet)	
Tubing Dian	neter (inche	ي کي	Turbidity Me	ter (S/N)·	Pine 2				3 Static Denth	0 - 40 to Water (feet)	
3/16ID x 0.2	50D W	, ,	-				HACH			28.40	
Tubing Mate PTFE (Tello			Water Level	Indicator: (S/I	" Pine	Tubing Depti	n (Begin/End) 35				
					h to Water) X	Well Capacity			Volume to be	Purged (gallons):	
= (	feet		feet) X	ŭ	ns/foot =		gallons		Total Volume	Purged (gallons):	
Purge Meth	od: Tradition		Volume Purge	("Sipping from	n the Top") or L	.ow-Flow ("Tu	bing in Mid 8	Screen")	<u></u>		
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm or	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation	
1225	0.75	0.75	28 9	17.57	27.79	4.10	6.62	105.7	141	0/5:14	
1331	0,50	1.25	29.05	17,51	29.18	2.32	6.59	123.3	109_	1111	
1337	0.50	6.75	29.08	17.56	29.90	1.90	6,56	126,8	85,1	41	
1345	0.75	2,50	29.18	17.58	30.39	1,58	b.55	726,6	46,7	"	
1349	0.75	2.75	29,20	17.57	30.48	1,49	6.54	120.5	32./	4	
1354	0.50	3.25	29,21	17.56	30,64	1,34	6.53	118.5	25.2	- 11	
135	0,05	3,50	29.23	17.58	30.82	1.24	6,53	113.8	14.0	1/	
1001	<u>() 25</u>	3.75 A. 2/5	<u> </u>	107 6 4	36 67A	1.05	6.52 6.51	96.5 88.4	17.7	Colors	
1411	1.25	4.50	29.29	1764	31.93	1.05	6.51	88 8	10.6	closes	
1414	0.25	4.75	29.29	17.64		1.00	6.51	87.6	9.34	Clear	
	₩ 2 2 ·-										
	_										
Well Capacity	/ (Gal/Ft):	0.75" = 0.02	1" = 0.04;	<b>1.25"</b> = 0.06;	2" = 0.16; 3" =		0.65; 5" =	1.02; 6" = 1	1.47; <b>12</b> " = 5.88		
					1014; 1/4° = 0.0 1 Охудеп: <u>+</u> 0.2 п				0.010; 5/8" = 0. Turbidity: <10 N		
				FIELD	SCREENING	SUMMAR	Υ				
Field Filtered	d: Ves No	Filter Size	a: Duni	icate: Yes	Duplicate	ID:	Time		MS/MSD:	Ves/No	
			creening Anal	ysis, Photogra	ph Information					ns/ Conditions.)	

Page 5 of 8

# **SMOKEY MOUNTAIN SMELTERS**

Knoxville, Knox County, Tennessee

March 2014
Quarterly Event 3
Remedial Investigation / Feasibility Study

Groundwater Sampling Log
Book 3 of 3



MANAGING THE VISION® | ENVIRONMENTAL | FACILITIES | LOGISTICS

#### **CALIBRATION LOG**

MANAGING THE VISION F ENVIRONMENTAL | FACILITIES | LOGISTICS

Site Name: Snoke, MAN. Snotes

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Date	Parameter	Initial Reading	Calibration Response	Verification Response	Time	End of Day Check	Time	Instrument Manufacturer	Serial Number	Calibration Standard Lot #/ Expiration	Signature
02/02/4	Dogs		97.2	<b>\</b>	1308	1.354	1524	KI 300	Oncops	10ge	
L	conduct.	1.555	1.413		<u>1310                                   </u>	<b>V</b>			23(108xi)-	>	
	0 H 70		6,910		1213	7.0	1534		2701425		
	OH \$10	392	4.00		1370	4.12	1527		£300 0425-	⇒ l	<del></del>
[	ORP'	244.7	246		1335	359. 2	1535		<u> </u>	>	
03/04/14	D0%_	24.7	94.7	. J.	0745	99.7	1657	YS/5/10	011871		
	conal	1.378	1.413		0763	1.410	11046				
	017.0	Cotto	6.960		OFOU	7.11	1650				
	7440	4.08	3.90		0803	4.28	1652				<u> </u>
	ORP	275	240	./	0807	226.9	1654		V	<u> </u>	
(B105/14		11000	99070	./.	0741	51.9	1434				
	Cord	1,291	1.413		0743	1.32	1437				
	DH7.0	7.00	6.98		0746	7.13	1440				
	DH4.0	4.00	4.01		M750	4.20	1442				
	MRP	1.337	1.413	V	0755	232.7	344T	7		<u> </u>	
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	4.4			- 4	:	200					
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Each instrument will be calibrated using calibration standards provided by the manufacturer or instrument vendorat the beginning of each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during each work day, after battery replacement during of the instrument/sensor responsor responsor responsor responsor responsor responsor respo

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ASSOCIATES, 11		OGISTICS	G	ROUND	WATER	SAMPI	LING LO	OG		
SITE NAM	E: Smokey	Mountain Sr	nelter Site_	SITE LOCA	ATION: Knox	ville, Tennes	see		DATE: 63/	103/2014
WELL NO	:10A			SAMPLE II	D: SMS#	wid	4		SAMPLE TI	
WEATHER	CONDITIO	NS/ GENER	AL OBSERVA	TIONS:	umol	$-\lambda$	non	بهوو	, Cost	2
<u>,                                     </u>			Pump: (S/N)		PURGING	DATA'			·	
Well Diame	eter (inches) uneter (inche .250D terial:	:		146						
,	,	RGE = (Tota	el Well Depth		h to Water) X				Volume to be	Purged (gallons):
= (	feet		feet) X		ons/foot =	,,o. Japaon	gailons			•
Purge Met	hod: Tradition	onal Multiple	Volume Purge	("Sipping from	n the Top") or l	_ow-Flow ("Τι	ubing in Mid S	Screen")	Total volume	Purged (gallons):
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp.	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
1337		.25	18,65	14.11	4.350	4.35	14.00	431.0	(0.5+	cleer
1345	<u>,23</u>	<u> 50 -</u>	19.01	17.57	4.373	3,44	3,20	42,0	770	Chear
1350	198	176	19.30	13.37	4.414	4.00	3.93	436.3	5.45	Clear
1403	<u>.ಎಽ</u> .ಎಽ	1,00	19.50	12.55	4.1093	391	3.93 3.90	11109	5.03 3.30	Clear
400	- <del>25</del>	1.50	19 CH	13.14	410008	3 24	355	413.0	3 65	ches
1414	25	1.75	1997	la de	7,000	3.260	3.710	420.5	2 29	rior
1427	.25	2.00	9.97	12.10	5.343	3.28	3.76	49.7	195	clear
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Well Capaci Tubing Insid Stabilization	le Diameter C	apacity (Gal/F	t): 1/8" = 0.000	06; 3/16" = 0.0	2" = 0.16; 3" = 0014; 1/4" = 0.0 1 Oxygen: ± 0.2 r	026; <b>5/16</b> " = 0	0.004; 3/8" = 0	0.006; <b>1/2</b> " =	1.47; 12" = 5.86 0.010; 5/8" = 0. Turbidity: <10 N	016
r <del></del>				FIELD	SCREENING		- Α		<del></del>	
	ed:_Yes/ No (Sample Ana		e: Dupli creening Analy	cate: (Pas/ No vsis, Photogra	Duplicate ph Information	ID: SIMS M , Rational for	Sample Metr	: <u>j4 3</u> 4 nod Used, V	MS/MSD: Vell Observatio	Yes (No ns/ Conditions.)
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SAMPLER	(S) SIGNAT	URE:	10				$\sqrt{}$			<del></del>
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THE VISION®   ENVIRON	MENTAL   FACILITIES	S   ŁOGISTICS	G	HOUNL	WAICH	SAIVIP	LING L	<u> </u>		
SITE NAM	E: Smokey	Mountain Sr	melter Site	SITE LOCA	ATION: Knox	ville, Tennes	see		DATE: (	3/04/2014
WELL NO		MWI	<i>09</i>	SAMPLE II	D: 3/15/	MUL	1 <i>P</i>		SAMPLE TI	ME: 0922
WEATHER	CONDITIO	NS/ GENER	AL OBSERVA	IIONS: (	va.	$\overline{}$	ely.	(A)	ezno	<del></del>
I TAKE 17 TO THE			T D (0/h))		PURGING	DATA			7-1-114 (1) 5	7
Well Type:	708/2		Pump: (S/N):		Court	e as			Total Well D	epth (feet):
Well Diame	eter (inches)	:	Water Quality	y Meter: (S/N	): ا	e as	man		Screen Inter	val (feet)
	meter (inche	es):	Turbidity Met	ter: (S/N):	· ·	100	ese 1		Static Depth	to Water (feet)
3/16ID x 0. Tubing Ma	terial:		Water Level	Indicator: (S/I		" <i>F</i>	0		Tubing Dept	/ 3S h (Begin/End)
PTFE (Tefl	,		1					1		
1 WELL V	OLUME PUF		al Well Depth feet) X	- Static Dept	h to Water) X ons/foot =		y gallons		Volume to b	e Purged (gallons):
(			Volume Purge	v		_ow-Flow ("To	_	Screen")	Total Volum	e Purged (gallons):
		Total	_===		Specific					<del></del>
Time	Volume Purged (gal	Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Conductance ms/cm <u>or</u> μS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
0843		30	3.35	12.33	16.10	.45	8.50	1917	-19.7	Clear
0850	25	525	3:34	12.3	9.365	039	8.49	173.3	16.1	Old
0850	246	1.00	3.34	11.93	9.389	37	3.50	161.7	15.3	Clear
0705	.25	1.25	3.34	11.72	9.488	. 33_	8.51	1000	13.5	Cles
0912	,25	150	3.34	1199	9409	. 32	8,50 -	4520	10.2	dear
0319	_&S	1.75	3.34	12.17	1.320	32	8.50	140.7	4.04	crec
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Well Capaci Tubing Insid	ie Diameter C	apacity (Gal/F	t): 1" = 0.04; t): 1/8" = 0.000 conductance: ± 5	06; <b>3/16</b> " = 0.0	0014; 1/4" = 0.0	026; 5/16" = 0	0.004; <b>3/8"</b> = 0	0.006; <b>1/2"</b> =	1.47; 12" = 5.8 0.010; 5/8" = 0 Turbidity: <10	.016
Stabilization	Criteria nang	je: Specific C	John Lance. ± 3		SCREENING			E O. P Gritt,		
				VA A	CLA		Of	No.	7	
NOTES:	ed: Yes/Mo Sample Ana	Filter Siz		cate Ces No sis. Phatcora		D. Over to Rational for		od Used. V	MS/MSD: Vell Observation	Yes/ No ons/ Soriditions.)
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SAMPLER	(S) SIGNAT	URE:	2 1	1 d	- 1/2	<del>/</del>				
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	E: Smokey i	Mountain Si	melter Site	SITE LOCA	ATION: Knoxy	ville, Tennes	see		DATE: 02	104/201	
	: JMS		B IAL OBSERVA	SAMPLE ID	: SMS	Clour	IIB		SAMPLE TH	WE: 1055	
	<del></del>	<del></del> _			PURGING I	DATA	X		<del></del> -	· ·	
Well Type:			Pump: (S/N)	): <del>-</del>	50	e sa b	8 2		Total Well D		
Well Diam	eter (inches):	:	Water Qualit	ty Meter: (S/N)	): / S				Screen Interval (feet)		
	meter (inche	rs):	Turbidity Me	ter: (S/N):	7	Or	O DOM	) 3.0	Static Depth	to Water (feet)	
3/16ID x 0. Fubing Ma PTFE (Tef	terial:	•	Water Level	Indicator: (S/N	v):	CAME WY	7	J.C.	Tubing Depti	h (Begin/End)	
WELL V	OLUME PUR		tal Well Depth feet) X		h to Water) X	Well Capacit			Volume to be	Purged (gallons	
•			•	_	n the Top") or L		_	3creen")	Total Volume	Purged (gallons	
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp.	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Colo Observation	
027		.25	10.2Ce	11.91	14.70	38	8-29	130.10	4.03	Olas.	
Nie	.75	50	6.46	12.107	14.67	.25	8 27	132.8	4.14	dec	
747	, <del>3</del> 5	.75	6.46	12.44	14.67	.25	3.00	125.8	295	Cleas	
050	.25	1.00	10.460	12.25	14.63	25	8.30	1260.0	2. De	cles	
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ubing insidu	ity (Gal/Ft): de Diameter C Criteria Rang	apacity (Gal/F	Ft): 1/8" = 0.00	06; 3/16" = 0.0	2" = 0.16; 3" = 0014; 1/4" = 0.00 d Oxygen: ± 0.2 n	026; 5/16" = 0	0.004; <b>3/8</b> " = 0	0.006; 1/2" =	1.47; <b>12"</b> = 5.88 0.010; <b>5/8</b> " = 0. <b>Turbidity</b> : <10 N	.016	
			<del>-</del>		SCREENING	3 SUMMAR	Υ	<del></del>			
ield Filter	and Tolk No.	Filter Ci-	10: Ken 17::01	FIELD			<del></del>		MS/MSD	Va No	
	ed: Yea/ No (Salmple Ana	Filter Siz	ze: <b>Y</b> M Dupli Screening Anal	FIELD	Duplicate	ID:	Time:		MS/MSD:	Yes No	
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ASSOCIATES, I	INC. ENTAL   PACILITIES   L	.OGISTICS	G	ROUND	WATER	SAMP	LING LO	og			
SITE NAM	/IE: Smokey	Mountain Sr	melter Site	SITE LOCA	ATION: Knox	ville, Tennes	ssee		DATE: O	3/094/14	]
WELL NO	: OMP	MUDIT	<u>₿</u>	SAMPLE II	o: SMSI	الناك	2B_		SAMPLE TI	ME:	
WEATHE	R CONDITIO	NS/ GENER	AL OBSERVA	TIONS:	lovel	,	Ø.				]
				m. 1	PURGING				r		7
Well Type	FUM	~	Pump: (S/N):	: Judy	versi b	Lie #70	20016		Total Well D	epth (feet):	
Well Diam	leter (inches)		Water Qualit	y Meter: (S/N	): ( Sa	nil a pa	5 on		Screen Inter	val (feet)	
	ameter (inche	es):	Turbidity Met	ter: (S/N):	ξ "	pa	-ge		Static Depth	to Water (feet)	
3/16ID x 0 Tubing Ma PTFE (Tef	aterial:		Water Level	Indicator: (S/ľ	1	1	, 0		Tubing Dept	h (Begin/End)	
= (	feet	-	 al Well Depth feet) X Volume Purge	gallo	ons/foot =	16.形3	gallons	olezus Screen")		e Purged (gallons): e Purged (gallons):	-
Time	Volume Purged (gal	Total Volume Purged	Depth to Water (feet)	Temp.	Specific Conductance ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation	İ
1301	,	(gal)	29.12	15.160	4.701	.71	6.71	91:1	111	Cherry	20,
1317	1.25	150	29 13	15.52	4.1008	.54	6.50	95.W	580	Ne de la	W.
1323	,50	2.00	29.13	1594	4517	138	10.55	50.8	369	donto	He
<u>1330                                   </u>	.50	250	29.13	16.00	4.395	· 30	6.50	39.0	33)	Clearly	#.
13 <u>3</u> %	.50	3.50	09.13	16.05	4.08	*988	0.58	83,7	474	Cleras	∥
12 10	.50	3,50	20113	16.00	2 60-	<u> </u>	4.51	78 ()	2016	Clovery	l
1402	250	4 50	89 H	110.00	2 KG	100	10 F.7.	78.4	214		H
14/18	50	5 CD	29 14	10.00	3.4110	.(9	1057	70	190	010000	1
MIS	50	5.50	2014	16.05	2 279	19	10,57	65,5	178	Clorole	
1425	(30)	6,00	2914	16.04	3.114	(9	6.57	623	174	Clordanta)	يها
143a	50	450	29.14	10.04	3.037	19	657	61.9	144	classifich	
1440	.50	7.00	Q9.14	16.11	2.980	,20	6.57	544	163	downly Cho	<u> </u>  /
Well Capac Tubing Insi- Stabilization	de Diameter C	apacity (Gal/Fi	; 1" = 0.04; 1 t): 1/8" = 0.000 conductance: ± 5	6; <b>3/16</b> " = 0.0	014; 1/4" = 0.0	026; 5/16" =	0.004; 3/8" = 0	0.006; 1/2" =		.016	
			<del></del>		SCREENING	SUMMAF	RY			<u>.,                                    </u>	1
	ed: Yes/No	Filter Siz	e: Sur Duplic	cate: Yes/No	Duplicate		Time		MS/MSD:		
NOTES:	(Sample Ana		,				•		/ell Observatio	ons/ Cenditions.)	
		Con	finue	col	6	P	cego	5			

VISIONAL ENVIRONMENTAL   FACILITIES   LOGISTICS	ROUNDWATER SAMPLING LOC	<u> </u>
SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: OR IORLINA
WELL NO: SMSMWBB	SAMPLE ID: SYSMWIAR	SAMPLE TIME: (547
WEATHER CONDITIONS/ GENERAL OBSERVA	ATIONS:	
	PURGING DATA	
Well Type: Pump: (S/N	():	Total Well Depth (feet):

	PURGING DATA	
Well Type:	Pump: (S/N):	Total Well Depth (feet):
Well Type: FUSA Well Diameter (inches):	Water Quality Meter: (S/N): \ Jane a paye I	Screen interval (feet)
Tubing Diameter (inches):	Turbidity Meter: (S/N):	Static Depth to Water (feet)
3/16ID x 0.25OD		- A.
Tubing Material:	Water Level Indicator: (S/N):	Tubing Depth (Begin/End)
PTFE (Teflon)		
1 WELL VOLUME PURGE = (To	otal Well Depth - Static Depth to Water) X Well Capacity feet) X gallons/foot = gallons	Volume to be Purged (gallons):
	e Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	Total Volume Purged (gallons):

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
154K	1000	16.00	29.14	13.90	2.674	.48	6.57	415	65	closelyla
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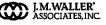
Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/18" = 0.0014; 1/4" = 0.0026; 5/18" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU

#### FIELD SCREENING SUMMARY

Field Filtered: Yes No Filter Size:		Time:	MS/MSD: Yes No
NOTES: (Sample Analysis, Field Scre	ening Analysis, Photograph Information, Rationa		I Observations/ conditions.)
high to	Ston LN to	Sample	WITH
high to	MbiOLH_	•	
	0		
			· :
	<del></del>		_, <del>-                                   </del>
SAMPLER(S) SIGNATURE:			
SAMPLER(S) SIGNATURE.			i



SIONY ENVIRONM	IENTAL   FACILITIES   L	OBISTICS	G	ROUND	WATER	SAMP	LING L	<u>og</u>			
SITE NAM	ME: Smokey	Mountain Sr	melter Si <u>te</u>	SITE LOCA	ATION: Knox	ville, Tennes	see		DATE: O	3056014	
WELL NO: MUXS SAMPLE ID: SMSMWOSA SAMPLE TIME: 0940											
WEATHE	R CONDITIO	NS/ GENER	AL OBSERVA	TIONS: SU	mel (	1001 N	Prost	٥٧	Crock	ol	
		-			PURGING	DATA			7		
Well Type	=105)4		Pump: (S/N):		$\overline{}$	o. (	2.a5		Total Well D	epth (feet):	
Well Dian	TUS)	:	Water Qualit	y Meter: (S/N	); /	Samo	Dar	2	Screen Inter	val (feet)	
Tubing Dia	ameter (inche	es):	Turbidity Met	ter. (S/N):	7	Seems	L'		Static Depth	to Water (feet)	
3/16ID x 0 Tubing Ma			Water Level	Indicator: (S/I	\ \		Tubing Depth (Begin/End)				
PTFE (Te				<b>(</b> ***	, <u>C</u> )					, , , , , , , , , , , , , , , , , , , ,	
			al Well Depth			Well Capacit		<u>.</u>	Volume to be	e Purged (gallons):	
= (	feet		feet) X	Ŭ	ons/foot =	: : // //	gallons	2	Total Volume	e Purged (gallons):	
Purge Me	tnod: Traditio	Total	Volume Purge	("Sipping from	Specific	LOW-FIOW ("11	Jibing in Mila :	screen)		·	
Time	Volume Purged (gal	Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation	
131_	-	1.00	20.55	llost	(0.274	.09	18:74	199.3	504	clouder	
<b>843</b>	1.35	0.25	20.60	10.71	0.33 <u>a</u>	000	8.74	130.5 100.5	132	stocky	
//\)\[\]\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	200	3.00	20.60	10.8	0.370	. 10	8.74	5.0.9	10/3 i	Cloudy fol	
7105 1411	1 (20)	500	70 100	17/10	10.5HC0	08	871	51.2	20	Clacer	
741U	7.00.5	10.00°	20 61	17.07	10.596	.10	8.74	47.0	31.0	Cler	
XYZ	7.005	700	20.61	17.00	10.6033	6 OG	8.74	416	22.4	clear	
<u> </u>	.50	6.50	20.61	17.07	10.1009	109	8.74	339	15.7	clex	
<b>5937</b>	.50	7.00	26.6	16,98	6.714	,09	8.74	<u> 33.3</u>	9.5	Cleck	
										<	
				-					<del></del>		
Well Capac	ity (Gal/Ft):	0.75" = 0.02	1" = 0.04;	1 <b>.25</b> " = 0.06;	<b>2"</b> = 0.16; <b>3"</b> :	= 0.37; 4" =	0.65; 5"=	1.02; 6" =	1.47; <b>12</b> " = 5.8i	8	
			t): 1/8" = 0.000 conductance: <u>±</u> 5								
				FIELD	SCREENING	G SUMMAR	Υ				
Field Filte	red: Yes/No	Filter Siz	e: Dupli	cate: Yes	Duplicate	ID:	Time	:	MS/MSD:	Yes/No	
NOTES:	(Sample Ana		creening Analy	sis, Photogra	ph Information					ons/Conditions.)	
			•								
	•								•		
										*	
				•					, , ·		

Page 6 of 8



GONT ENVIRONMENTAL   PACILITIES   LOGISTICS								
SITE NAME: Smokey Mountain Smelter Site SITE LOCATION: Knoxville, Tennessee DATE: C8/05/14						3/05/14		
WELL NO: SMS MW DA SAMPLE ID: SMSMLUBA SAMPLE TIME: 1145							ME: //45	
WEATHER CONDITIONS/ GENERAL OBSERVATIONS: SUMMERY CLEAN								
PURGING DATA								
Well Type:	Well Type: Pump: (S/N): Total Well Depth (feet):							
Well Diameter (inches): Water Quality Meter: (S/N): Screen Inferval (feet)								
Tubing Diameter (inches):  Turbidity Meter: (S/N):  Turbidity Meter: (S/N):  Turbidity Meter: (S/N):								
3/16ID x 0.25OD Tubing Material: Water Level Indicator: (S/N): Tubing						Tubing Depth	n (Begin/End)	
PTFE (Teflon)	VValor 20101 maioator. (0)	```.	(			Tobing Dopa	r (Degili/Elid)	
1 WELL VOLUME PURGE = (To	tal Well Depth - Static Dep	th to Water) X	Well Capacit			Volume to be	Purged (gallons):	
= ( feet -		ons/foot =	ou Flow (*T	gallons	Para a mill	Total Volume	Purged (gallons):	
Purge Method: Traditional Multiple	Volume Purge ("Sipping fro		.ow-Flow (*1t	abing in Mia s	screen")			
Volume Total Time Purged Purged (gal (gal)	Depth to Water (feet)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation	
1128 - 175	29.71 110,46	2.047	.40	6.74	94.1	21.75	cles	
1135 .50 1.25	29.71 16.75	2.047	40	6.73	96.0	59	Cleer	
1143 .50 1.75	29.72 10.99	D.034	144	673	922	9.84	Cler	
			_	<u> </u>				
<u> </u>	<del> </del>							
					-			
		-	<u> </u>					
		<del>                                     </del>				<u> </u>		
					,			
Well Capacity (Gal/Ft): 0.75" = 0.02 Tubing Inside Diameter Capacity (Gal/F Stabilization Criteria Range: Specific C	2; 1" = 0.04; 1.25" = 0.06; Ft): 1/8" = 0.0006; 3/16" = 0. Conductance: ± 5%; Dissolve	0.014: $1/4$ " = $0.00$	26: 5/16" = (	0.004: 3/8'' = 0	).006: 1/2" =	1.47; <b>12"</b> = 5.88 0.010; <b>5/8"</b> = 0. Turbidity: <10 N	016	
	FIELD	SCREENING	SUMMAR	Y				
Field Filtered: Yes No Filter Siz	zer Zin Duplicate: Yes/N	Duplicate	ID:	Time		MS/MSD:	Vac No	
NOTES: (Sample Analysis, Field S	Screening Analysis, Photogra	aph Information,	Rational for	Sample Meth	od Used, V	Vell Observatio	ns/ Conditions.)	
hoxavalera	Chamilton	collec	Exell		`		·	
•								
						,		
<u> </u>							<del></del>	
SAMPLER(S) SIGNATURE								

ASSOCIATES, INC. VISIONAL ENVIRONMENTAL   FACILITIES   LOGISTICS	GROU	NDWATER SAM	PLING LOG						
SITE NAME: Smokey Mountain Sme	DATE:	3105114							
WELL NO: 345MWOTH									
WEATHER CONDITIONS/ GENERAL OBSERVATIONS: Survey breezy war									
Well Type: Pump: (S/N):  Total Well Depth (feet):									
Well Diameter (inches):	1 39	Screen Interval (feet)							
Tubing Diameter (inches): Turbidity Meter: (S/N): DIEN UZV Static Depth to Wa									
3/16ID x 0.25OD Tubing Material: PTFE (Teflon)	Water Level Indicator:	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	age	Tubing Depth	ı (Begin/End)				
1 WELL VOLUME PURGE = (Total V		Depth to Water) X Well Cap gallons/foot =	acity gallons		Purged (gallons):				
Purge Method: Traditional Multiple Vol	lume Purge ("Sipping	from the Top") or Low-Flow	("Tubing in Mid Screen")	Total Volume	Purged (gallons):				
Volume Total Volume Volume Time Purged Purged (gal (gal)	Depth to Water (feet)		n (standard (mV)	Turbidity (NTUs)	Odor/ Color Observation				
1310 - 50 3	34.44 18	237.87,37	- 5.79 /al.6	60.7	clearish				
1318 .5D 1.00 3	<del></del>	634.45 .28	5.80120.4	53.4	der.				
1325 -50 1.50 3		8 34.51 25	5.81 119.8		Cleer_				
1333 50 2.00 3 1341 5 250 3	34.51 18.7	5 34.70 20 5 21 87 10	581 120 C	18:3	Clear				
1591 10 000	24.51 10.0	0 34.82 119	J. O. A. 110-0	ستن کی ۱۰					
					·····				
Well Capacity (Gal/Ft): 0.75"= 0.02; Tubing Inside Dlameter Capacity (Gal/Ft): Stabilization Criteria Range: Specific Cond	1/8" = 0.0006; 3/16" :	= 0.0014; 1/4" = 0.0026; 5/16	= 0.004; 3/8" = 0.006; 1/2" =	1.47; 12" = 5.88 = 0.010; 5/8" = 0.0 Turbidity: <10 N	016				
	FIE	LD SCREENING SUMM	ARY						
Field Filtered: Yes No Filter Size:	Duplicate: Yes	No Duplicate ID:	Time:	MS/MSD:					
NOTES: (Sample Analysis, Field Scre	ening Analysis, Photo	ograph Information, Rational	for Sample Method Used,	Well Observation	ns/ Conditións.)				
	*								

# SMOKEY MOUNTAIN SMELTERS Knoxville, Knox County, Tennessee

March 2014
Quarterly Event 3
Remedial Investigation / Feasibility Study

Surface Water Sampling Log
Book 1 of 1



MANAGING THE VISION® | ENVIRONMENTAL | FACILITIES | LOGISTICS



#### **CALIBRATION LOG**

#### Site Name:

Date	Parameter	Initial Reading	Calibration Response	Verification Response	Time	End of Day Check	Time	Instrument Manufacturer	Serial Number	Calibration Standard Lot #/ Expiration	Signature
3/3/14	und.	14 27			10:10 CAM		16:47	YSI556	014899	Lot 10520 Kg/14	y dec
1 4	PHT	7.10			10 25	6.84	16:44	11	Ч	PH-7 26380 020	15
, š	PHIO	9.93			10:30	9.96	16:47		¢.	231088414/151	15
3/	0.0.		> out	range	10:40	80.4	16:52	**	e V	<u> </u>	
1,	0	92.2	97.8	ار	1 Lan			1	il	, ,	
1 10	ORIR	251.4	240,0		1110	255.	16:50	ħ	l ₁	5245 /11/17	1. 0
1 to	Cond	1.357			14:14			ŧ۱	ħ	Ц	
	PH	6.81			(145			l)	1)	11	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
34/14	00	A19,6	99 t		7:30	97.8	16:17	1)	17	ħ	
- B. E.	correct.	1,747			7:35	1.414	16:26	1)	11	ij	
4.	PH 7	6.11	10.04		71.57	7.02	16:30	1)	ly.	17	
9 k	MIO	8.44	8.		7:39	10.13	16:37	in .	1 '	1)	
ž 2	OPP	227.1	240	_	7:45	240	16:46	lq .	li	1)	· ( )
3/5/14	00	99.0	93.9		7.47	79	1435			\	
	cond.	1.428	1.432		7:52	1747	1428		تدامعه فه		
4:	PHI	6.92	<u> </u>			7.30	1440	ě ·			<u> </u>
11	PHID	10.6				9.98	1443		a postrila t		
18	ORP	239				2179	1445	1	and the		
					!			and the second	2, 1500	0 0 0 0	7.00
		· -						***	المانية المانية	2	
								September 1			
										Ÿ	
-											

Each instrument will be calibrated using calibration standards provided by the manufacturer or instrument vendorat the beginning of each work day, after battery replacement during each work day, after sensor maintenance during each work day, and after a failed calibration verification. Calibration consists of stabilization and electronic "spanning" of the instrument/sensor resposne to the calibration standard set via instrument software and manufacturer's instructions. Calibration verification consists of stabilization of the instrument/sensor with the calibration standard set to verify response within +/10% of the calibration standard set value. Calibration verification will be performed immediately following calibration, at the end of each instrument use period (ie before turning the instrument off), at initiation of instrument use after restarting (ie after turning the instrument on after a shutdown during the work day), at any time during the work period when instrument readings are suspect, and at any time directed by the FOL. Include the unit of measure, i.e. "mV", "S,U.", "NTU", etc. in the calibration value column. THE FOL WILL REVIEW THIS CALIBRATION LOG AND COMPLETE THE FORM WITH HIS/HER SIGNATURE AT THE END OF EACH WORK DAY.

		<b>9</b> 1	ì
FOL Name:	FOL Signature:	30	

VISIONY ENVIRONME	ENTAL   FACILITIES   L	.OGISTICS		<u>UR</u> I	ACE V	VATER	<u>SAMPLI</u>	<u>NG</u> LO	<u>G</u>				
SITE NAM	/E: Smokev	Mountain Sn	nelters		SITE LOC	ATION: Kno	xville, Tenne	SSEE		DATE: 3/3/14			
SAMPLE	<u> </u>	1955VW						- 10		SAMPLE TIME:   1,17			
OAWF LL					_					SAMPLE TIME.			
Time	Temp. (°C)	Specific Conductanc ms/cm or µS/cm	້   Ox	solved tygen ng/L)	pH (standar d units)	ORP (mV)	Turbidity (NTU)			Fe (capsule)			
Tim	7.02	0.123	10	7,7	594	4.3				Range :			
Stream Fl	Ow rate:	1.		Stream	width:	<u> </u>	Stream der	ath:	<b>!_</b>				
	red: Yes/No	Filter Siz	a·		ate: Yes/No	Duplicate		Time	<del></del> -	MS/MSD: Yes/ No			
		<u> </u>	<u>.                                    </u>	Dupilo	a.c. 163/110			- 111100		I MOJINGED. 165/140			
SAMPLE	R(S) SIGNAT	15/16 C			-								
Notes:													
SITE NAM	Æ: Smokev	Mountain Sn	nelters		SITE LOCA	TION: Knox	ville, Tenness	ee		DATE: 3/3/14			
_		M55,1~1					<del>,</del>			SAMPLE TIME: 13 20			
SAMPLL	SAMPLE ID: SPIS 3 LOT I												
Time	Temp. (°C)	Specific Conductan ce ms/cm or µS/cm	Disso Oxyg (mg	jen	pH (standard units)	ORP (mV)	Turbidity (NTU)			Fe (capsule)			
p i20	7.68	0.239	90.	J	6.60	35.5		-		Range :			
Ϋ	<u>'                                     </u>	<u> </u>		<u>_</u>		<u> </u>	<u>l</u>		l	nesuit.			
Stream Fl		,		Stream		<del>-</del> _	Stream der			<u> </u>			
Field Filter	red: Yes/No	Filter Size	<u>e:</u>	Duplica	ate: Yes/ No	Duplicate	ID:	Time	:	MS/MSD: Yes/ No			
SAMPLER	R(S) SIGNAT	URE:	ع		•		-						
Notes:	173/1				,	/.							
SITE NAM	IE: Smokey	Mountain Sm	nelters		SITE LOCA	TION: Knox	ville, Tenness			DATE: 3/3/14			
SAMPLE	- H	ns 14	_							SAMPLE TIME 快:15			
Time	Temp.	Specific Conductan ce ms/cm or µS/cm	Disso Oxyg (mg	jen	pH (standard units)	ORP (mV)	Turbidity (NTU)			Fe (capsule)			
	7.78	0.410	88:	5	6.80	19.4				Range :			
Stream Flo	ow rate	<u> </u>		Stream			Stream der	 oth:					
Field Filter	red: Yes/No				ate: Yes/No Duplicate ID: Time:					MS/MSD: Yes/ No			
SAMPLER	R(S) SIGNAT	URE: HAC											

SURFACE WATER SAMPLING LOG

SITE NAM	E: Smokey	Mountain Sn	nelters	SITE LOCA	TION: Kno	DATE: 3/3/14		
AMPLE I	D: 5MS	55W	13	· · · · · · · · · · · · · · · · · · ·				SAMPLE TIME: 4:50
Time	Temp. ( ^O C)	Specific Conductan ce ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)	<del></del>	Fe (capsule)
4126	7.76	0.457	83.6	7.30	7.5			Range :
tream Flo	w rate:		Strea	m width:	· · · · · · · · · · · · · · · · · · ·	Stream dept	h:	
ield Filter	ed: Yes/No	Filter Siz	e Duni	icate: Yes/ No	Duplicat	e ID.	Time:	MS/MSD: Yes/ No

Notes: HGC

SITE NAM	IE: Smokey	DATE: 3/3/14 SAMPLE TIME: 16:10						
Time	Temp. (°C)	Specific Conductan ce ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)		Fe (çapsule)
	4 20	- 4a U	84.0	7.09	-10.7	1		Range :
がなど	1.20	7	04.0	1.01	-10.1			Result:
Stream Fk	ow rate:		Strea	ım width:		Stream depth	<b>:</b>	
Field Filter	red: Yes/No	Filter Siz	e: Dup	licate: Yes/ N	o Duplicate	MS/MSD: Yes/ No		

SAMPLER(S) SIGNATURE:

Notes: HGC

SITE NAM		Mountain Sn	melters		ATION: Knox	ville, Tenness	ee	DATE: 3/3/14  SAMPLE TIME: 5:45
Time	Temp. (°C)	Specific Conductan ce ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)		Fe (capsule)
15:45	12:91	0.579	58.5	703	-9.5			Range :
Stream Flo	ow rate: ed: Yes/No	Filter Siz	_	m width:	Duplicate	Stream dep	th:	MS/MSD: Yes/ No

SAMPLER(S) SIGNATURE:

Notes:

HGC



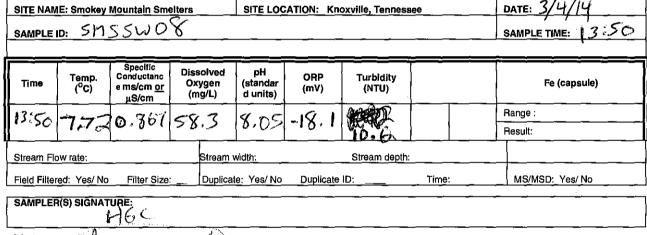
SURFACE WATER SAMPLING LOG

	NTAL   FACILITIES   LI	Mountain Sme	<u>-</u>			oxviile, Tenna			DATE: 3/4/14			
SAMPLE	D: 517	155W 6	LO						SAMPLE TIME: 7:47			
								<u>'</u>				
Time	Temp. ( ^o C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolve Oxygen (mg/L)	d pH (standard units)	ORP (mV)	Turbidity (NTU)			Ferrous Iron (Field Test)			
1457	4.75	0.299	77.1	8.26	-45.9				Range :			
1.7 1.	1.6.		7 7 1	٠		:			Result:			
Stream Flo	w rate:		Stream	width:		Stream dep	oth:					
Field Filter	ed: Yes/ <u>No</u>	Filter Size:	Duplic	ate: Yes/No	Duplicate	ID:	Time:		MS/MSD: Yes/ No			
SAMPLER	(S) SIGNAT	URE	_									
Notes:	mili	de o	B m	nall	Qaki	v _I ra	nall	h	dock			
SITE NAM	F: Smokey I	Mountain Sme	itare	SITE LOC	ATION: Knz	oxville, Tenne		T	DATE: 3/4/14			
		455W		1 0112 200	ATION: KIK	okvino, reinie			1			
SAMPLE ID: 5 19 55 W U S SAMPLE TIME:												
Time	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	i pH (standard units)	ORP (mV)	Turbidity (NTU)			Fe (capsule)			
		<b>V</b> -							Range :			
			<u> </u>						Result:			
Stream Flo	w rate:		Stream	width:	-	Stream dep	th:					
Field Filter	ed: Yes/No	Filter Size:	Duplic	ate: Yes/No	Duplicate	ID:	Time:		MS/MSD: Yes/ No			
SAMPLER	(S) SIGNAT	URE:										
Notes:	lake	- Sovel	too	Jon	to re	sch.	sam	ple a	*\ea			
OFF NAME	F. C!	Manustain Cons	140	0.75 1.0047					DATE: 3/4 /14			
	<i>*</i> 1	Mountain Sme Mららい	()	SHE LOCAL	ION: KROXV	rille, Tenness			DATE: 74/14  SAMPLE TIME: 916			
SAMPLE I	D: 3	11500	10	<del></del>					SAMPLE TIME: 716			
Time	Temp. ( ^O C)	Specific Conductan ce ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)			Fe (capsule)			
9:16	4.84	4	18.4	8.28	41.2				Range :			
Stream Flo	w rate:	· · · · ·	Stream	width:		Stream dep						
	ed: Yes/No	Filter Size:		ate: Yes/No	Duplicate		Time:		MS/MSD: Yes/ No			
	(S) SIGNAT						11110.		1			
VAUIT LEF	ijo) SidiMi	H6C	par d	^	_							
Notes:	low	John.		ample	tek	or h	QD.	1701M	uf cove			

Page 3 of 6

0

		Mountain Smelt		SITE LOCA	ATION: Kno	oxville, Tennessee	SAMPLE TIME: 12:54
Time	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)	Ferrous Iron (Field Test)
2.54	7.06	1.120	97:5	900	20 5	15.6	Range :
21.57			12.	1.10	70 (2)		Result:
Stream Flo	w rate:		Stream v	width:	· ·	Stream depth:	
ield Filter	ed: Yes/No	Filter Size: _	_   _ Duplicat	e: Yes/No	Duplicate I	ib; Tim	e: MS/MSD: Yes/ No
Notes:	(S) SIGNATI	HGC eini	Jales	d -1	aus'	location	



Notes:

SITE NAM	Qu	Mountain Sm SSい(		SITE LOCA	TION: Knox	ville, Tennessee		DATE: 3/44/14  SAMPLE TIME 3:38
Time	Temp. (°C)	Specific Conductan ce ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)		Fe (capsule)
10 -6	Gi	176	37.4	8 09	-25.8	717		Range :
1,28	12.31	1.700	70,71	0.01	-23.8	0.1.5		Result:
Stream Fic	ow rate:		Strea	m width:		Stream depth:		
Field Filter	ed: Yes/No	Filter Size	e: Dupl	icate: Yes/ No	<u>Duplicate</u>	ID:	Time:	MS/MSD: Yes/ No

SAMPLER(S) SIGNATURE:

				WAIERS	_			DATE: 3/4/14					
	<: W	Mountain Sme $  SS  $		SHE LOC		oxville, Tenne Sい94	(Oupe)	edleita					
SAMPLE	ID: ノい	1336	01		2112	36374	COUPY	SAMPLE TIME: 17,40					
<u> </u>		Specific	Dissolv	red pH									
Time	Temp. (°C)	Conductance ms/cm <u>or</u> μS/cm	Oxyge (mg/L	en (standard	ORP (mV)	Turbidity (NTU)	Flow Rate	Ferrous Iron (Field Test)					
	5.66	0.793	58.	4 7.81	26.1	19.7		Range:					
<u> </u>						1	<u> </u>	Result:					
Stream Flo	ow rate:			am width:		Stream dep	<del></del>						
Field Filter	ed: Yes/No	Filter Size:	Dup	licate: (Yes/ No_	Duplicate	1D: 44	Time: 14:57	MS/MSD: Yes/ No					
SAMPLEF	(S) SIGNAT	URE:											
Notes:								<del></del>					
1101001													
SITE NAM	SITE NAME: Smokey Mountain Smelters SITE LOCATION: Knoxville, Tennessee DATE: 3/4/14												
SAMPLE I	SAMPLE ID: SM SS WIZ SAMPLE TIME: 15:30												
Time	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolve Oxygen (mg/L)		ORP (mV)	Turbidity (NTU)		Fe (capsule)					
15:30			€ 3	7:75	25.5	11.4		Range:					
13.50	5.72		سه ۱۵ مرمه	1.13		***		Result:					
Stream Flo	w rate:		Strea	am width:		Stream dept	th:						
Field Filter	ed: Yes/No	Filter Size:	Dup	licate: Yes/ No	Duplicate	ID:	Time:	MS/MSD: Yes/ No					
SAMPLER	(S) SIGNAT	URE:	16		_			<del></del>					
1		(100	<u>~</u>										
Notes:		and making the residence of the same of a second of	to you make a constitution of the second										
*						•		0					
			•										
, v **				<u> </u>				2/2/11					
		Mountain Sme	-=4	SITE LOCAT	ION: Knox	ville, <u>Tenness</u> e	<u>ee</u>	DATE: 3/5/14					
SAMPLE I	D: >1	155WG	12			<u> </u>		SAMPLE TIME: 15 T					
	<del></del>	Specific	Dissolved	- NU		T	<del></del>						
Time	Temp. (°C)	Conductan ce ms/cm <u>or</u> µS/cm	Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)		Fe (capsule)					
15-11-	211	_	/ \ /.	7.00	10.8	39.5		Range :					
113,45	8.4	1,883	00.0	1.00		11.3		Result:					
Stream Flo	w rate:		Strea	am width:		Stream dept	h:						
Field Filter	ed: Yes/No	Filter Size:	Dup	licate: Yes/No	Duplicate	ID:	Time:	MS/MSD: Yes/ No					

SAMPLER(S) SIGNATURE

#### SURFACE WATER SAMPLING LOG

SITE NAM	/IE: Smokey	Mountain Sn	neiters	SITE LO	CATION: Kn	DATE:				
AMPLE	ID:							SAMPLE TIME:		
Time	Temp. (°C)	Specific Conductand ms/cm ou µS/cm	ce Dissoi	en (standard	ORP (mV)	Turbidity (NTU)	Flow Rate	Ferrous Iron (Field Test		
		•						Range :		
	<u> </u>							Result:		
Stream Flo	ow rate:		Stre	eam_width:		Stream dept	h:			
Field Filter	red: Yes/No	Filter Size	e: Du	plicate: Yes/ No	Duplicate	ID:	Time:	MS/MSD: Yes/ No		
SAMPLER	R(S) SIGNAT	rure:		. ,						
	. ,									
Votes:										
voles.		•								
						_				
SITE NAM	IE: Smokey	Mountain Sm	elters	SITE LOC	CATION: Kn	oxville, Tenne	SS <b>98</b>	DATE:		
SAMPLE I	ID-							SAMPLE TIME:		
)					<u> </u>			OAIN EE TINE.		
	_	Specific	Dissol	ved pH	T					
Time	Temp. (°C)	Conductanc ms/cm <u>or</u> µS/cm	;e	en (standard	ORP (mV)	Turbidity (NTU)		Fe (capsule)		
								Range:		
								Result:		
Stream Flo	ow rate:		Stre	eam width:		Stream dept	h:			
Field Filter	red: Yes/No	Filter Size	e:Du	plicate: Yes/No	Duplicate	ID:	Time:	MS/MSD: Yes/ No		
AMPLER	R(S) SIGNAT	URF:								
	i(e) ciaiiri	J.1.2.								
Notes:								<del> </del>		
10100.										
•						•				
SITE NAM	IE:			SITE LOCA	TION: Knox	ville, Tennesse	e	DATE:		
	ID:				-			SAMPLE TIME:		
SAMPLE								,		
SAMPLE I		Specific Conductan	Dissolved	i pH	000	T	· · · · · · · · · · · · · · · · · · ·			
SAMPLE I	<b>-</b>		Oxygen	(standard	ORP (mV)	Turbidity (NTU)		Fe (capsule)		
SAMPLE I	Temp. (°C)	ce ms/cm	(ma/L)	Units}				Donne .		
	Temp. (°C)		(mg/L)	units)				Bange :		
	Temp. (°C)	ce ms/cm	(mg/L)	units)				Range :		
Time	(°C)	ce ms/cm	(mg/L)					Range : Result:		
	(°C)	ce ms/cm	(mg/L)			Stream dept	h:			

Page 6 of 6

## SMOKEY MOUNTAIN SMELTERS

Knoxville, Knox County, Tennessee

June 2014

Quarterly Event 4

Remedial Investigation / Feasibility Study

Groundwater Sampling Log
Book 1 of 3



MANAGING THE VISION® | ENVIRONMENTAL | FACILITIES | LOGISTICS



MANAGING THE VISION® ENVIRONMENTAL & FACILITIES | LOGISTICS

#### **INSTRUMENT AND CALIBRATION LOG**

Site Name:

Date	Parameter	Calibration Value_	Time	Verification Response	Time	Signature	Instrument Type and Manufacturer	Serial Number	Calibration Standard Lot
0/0/0	example ORP cal and verification	240 mV	803	238.7	813	Signature	Example/Example	Pine 010111	N6L77-8
0/0/0	example pH 7 verification		<u> </u>	6.98	1752	Signature	Example/Example	Pine 010111	M6A84-2
6.23				1747		<u> </u>	15165 h 1952	127347	
ĺ	COND	111 11 1		440					
$\perp$	PW4	4.0	8132	417					
	0h7	170		7:15		(1			
	eh10	110			8:15	31			
	Do		8 45	82.2% 7	144 82	5-54			
T i		T						<del>1-7</del>	<del></del>
	OLD	240	4101	241	1520	50			
2		1,412	403	1,39		, Y			
_	1 16	10	1164			?x			
<b>-</b>		7		7.2	1525	Zj	<del>                                     </del>		
	2/10	10				SP			
77	60							1 1	
		1	<del>- 4.7</del>	<del></del>			<del> </del>	<del>                                     </del>	
		<del>]</del>	<u> </u>	<del>                                     </del>	1		<del>                                     </del>	1	
G 24	000	211	1000	7.47	112 à	01	<del>                                     </del>	<del>† † -  </del>	
C/19	ν	1713	+		127		+	<del>-                                    </del>	
1.	<del></del>	+ 4 3 3 3	<del>                                     </del>			<del></del>	<del> </del>	<del> </del>	
<del></del>	<del></del>	<del> </del>				<del></del>	<del></del>	<del></del>	
	$\Gamma = \Gamma$ , $\overline{\lambda} = \overline{\lambda} = \overline{\lambda}$	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -				<del></del>	<del>-                                    </del>	╆╼╲╾╾┤	<del> </del>
	<del>                                     </del>	10:0		17170				<del>                                     </del>	<del></del>
	<del> </del>	<del> </del>	$\mu$	<del> </del>	1' <del>&gt; X</del>	<del></del>	<del> </del>	1	·
1		<del></del>	<del> </del>	<del>}</del>	<del> </del>		<del></del>	-}	
	0/0/0 0/0/0 6.23	0/0/0 example ORP cal and verification 0/0/0 example pH 7 verification 6.28 ORP COND PN 7 PN 10 DO COND COND PN 4 PN 7 PN 10 DO COND COND COND COND COND COND COND C	Date Parameter Value  0/0/0 example ORP cal and verification  0/0/0 example pH 7 verification  0/0/0 example pH 7 verification  0/0/0 PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO PATE TO	Date	Date	Date         Parameter         Value         Time         Response         Time           0/0/0         example ORP cal and verification         240 mV         803         238.7         813           0/0/0         example pH 7 verification         -         -         6.98         1752           6:28         ORP         7.10         8.30         147         2.06           COND         1,413         8.31         140         8.05           DN         40         8.32         147         8.05           DN         7         7.10         8135         7.11         8.16           DN         7         10         8135         7.11         8.16           DN         10         8135         7.11         8.16           DN         10         8135         7.11         8.16           DN         10         8137         7.12         8.15           DN         11413         103         1.24         1.24           DN         11413         103         1.24         1.24           DN         10         100         100         1.24         1.25           DN         10         100	Date	Date	Date

Each instrument will be calibrated using calibration standards provided by the manufacturer or instrument vendorat the beginning of each work day, after battery replacement during each work day, after sensor maintenance during each work day, and after a failed calibration verification. Calibration consists of stabilization and electronic "spanning" of the instrument/sensor resposne to the calibration standard set via instrument software and manufacturer's instructions. Calibration verification consists of stabilization of the instrument/sensor with the calibration standard set to verify response within +/- 10% of the calibration standard set value. Calibration verification will be performed immediately following calibration, at the end of each instrument use period (ie before turning the instrument off), at initiation of instrument use after restarting (ie after turning the instrument on after a shutdown during the work day), at any time during the work period when instrument readings are suspect, and at any time directed by the FOL. Include the unit of measure, i.e. "mV", "S.U.", "NTU", etc. in the calibration value column. THE FOL WILL REVIEW THIS CALIBRATION LOG AND COMPLETE THE FORM WITH HIS/HER SIGNATURE AT THE END OF EACH WORK DAY.

FOL Signature:



#### INSTRUMENT AND CALIBRATION LOG

Site Name:

Date	Parameter	Calibration Value	Time	Verification Response	Time	Signature	Instrument Type and Manufacturer	Serial Number	Calibration Standard Lot	}
0/0/0	example ORP cal and verification	240 mV	803	238.7	813	Signature	Example/Example	Pine 010111	N6L77-8	] .
0/0/0	example pH 7 verification		_	6.98	1752	Signature	Example/Example	Pine 010111	M6A84-2	}
6-24	ORD	240	300					<u> </u>	L	<b>.</b>
( , , , , , , , , , , , , , , , , , , ,	COUD	143	3(a)				<u> </u>	<u> </u>		<u>[</u>
	P74	4-0	2:02			·		<u> </u>		1
	oh7		3:05				<u> </u>	<u> </u>		_
L	philo	10.0	31.10							<u> </u>
		0155	215					PINTODES	1,	
W25	DO '	89.3	はは	160.0	0815	(Ins	YSISTOME	<u> </u>	100011	10 m
	<u> </u>	1.420	PX15	11413	0818	1	<del> </del>	<del>}</del> \	23.670 KYO	1.041
	P#7	7.07	OXIS	7.00	<u> هج کړې</u>		<del> </del>		3	
<u></u>	OH4	4.00)	<b>199</b> 3	40	¢్రిఫ్ర€4		<del>  </del>	<del>                                     </del>	OSIA 30	4.11
<b></b>	TORP	2295	70 X 240	340	0830	<u> </u>			5345	olf:
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<u> </u>		<b> </b>	<u></u>		<b> </b>		<del> </del>	<del> </del>	<u> </u>	
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<u> </u>		<del> </del>	<del> </del>		<del></del>		<del> </del>	<del> </del>		
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<b></b>	<del></del>	<del> </del>	<del></del>		<del> </del>	<b></b>	<u> </u>	<del></del>	<del> </del>	1
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L	<del></del>	<del></del>	L	L	<del></del>		<del></del>	<del></del> -	<u> </u>	٠ .

Each instrument will be calibrated using calibration standards provided by the manufacturer or instrument vendorat the beginning of each work day, after battery replacement during each work day, after sensor maintenance during each work day, and after a failed calibration verification. Calibration consists of stabilization and electronic "spanning" of the instrument/sensor resposne to the calibration standard set via instrument software and manufacturer's instructions. Calibration verification consists of stabilization of the instrument/sensor with the calibration standard set to verify response within +/- 10% of the calibration standard set value. Calibration verification will be performed immediately following calibration, at the end of each instrument use period (ie before turning the instrument off), at initiation of instrument use after restarting (ie after turning the insturment on after a shutdown during the work day), at any time during the work period when instrument readings are suspect, and at any time directed by the FOL. Include the unit of measure, i.e. "mV", "S.U.", "NTU", etc. in the calibration value column. THE FOL WILL REVIEW THIS CALIBRATION LOG AND COMPLETE THE FORM WITH HIS/HER SIGNATURE AT THE END OF EACH WORK DAY.

		·	
FOL Name:	·	 FOL Signature:	 





REVISION* ENVIRONMENTAL   FACILITIES   LOGISTICS	INCUMPATER SAMPLING LOG	<u>*                                     </u>
SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 6-23
WELL NO: 7. A	SAMPLE ID:	SAMPLE TIME: ()(3()
WEATHER CONDITIONS/ GENERAL OBSERVA	ATIONS:	
	PURGING DATA	

	PURGING DATA	
Well Type:	Pump: (S/N): 024611	Total Well Depth (feet):
Well Diameter (inches): 7	Water Quality Meter: (S/N): R734 (	Screen Interval (feet)
Tubing Diameter (inches): 3/16ID x 0.25OD	Turbidity Meter: (S/N): 1898	Static Depth to Water (feet)
Tubing Material:	Water Level Indicator: (S/N): 12 82	Tubing Depth (Begin/End)
PTFE (Teflon)		2015
1 WELL VOLUME PURGE = (1	otal Well Depth - Static Depth to Water) X Well Capacity feet) X gallons/foot = gallons	Volume to be Purged (gallons):
,	le Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	Total Volume Purged (gallons):

			<u> </u>	, . , p					<u></u>	
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
915	125	125	18.90	17.65	37.61	138	6,17	176,7		
920	.55	,5	18090	16,70	37/71	.39	6 70	1268		
945	125	175	1844	18.38	41,74	151"	6.43	1)6.6	4318	
950	a.25	1.0	18.99	18.39	41.49	152	6,42	1221	3740	
955	4.25	1,25	19.65	18:26	40.98	1,20	6,41	140	2611	
1000	225	1,5	P105	1826	40.92	121	6139	144	19.9	
1005	6:25	1,15	19.05	18.05	40.69	1-1	6.38	1466	14.7	
1010	250	2.0	19:05	18:07		1.18	6.38	1796	101	
1015	25	7,25	19005	18.16	40.78	1/11/5	6,37	1531	5.6-	
10/6	D.25	7.50	19,05	18.07	40,76	1116	6,39	1560	6188	
1025	B. 25	2.7)	19.05	18:05	46.74	1,14	6.39	1663	6,38	
1030	78,83	3.0	19,05	18,05	40.77	シー	6,39	166.3	5146	
		1				,			7.	
										· · · · · · · · · · · · · · · · · · ·
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										_

Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 Tubing Inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU

#### FIELD SCREENING SUMMARY

Field Filtered: Yes/ No Filter Size:		ate ID: Time:	MS/MSD: Yes/ No
PHOTO LOG: (Photo number, time/da	le, direction photo is facing, description	on of photographed subject)	
		· · · · · · · · · · · · · · · · · · ·	
General Notes: (Well observations/ co	nditions, reason if deviation from SA	P/ Protocol)	7.
General Notes: (Well observations/ CO PAUSE PURCLES RE ROLLING V COURSE CO	CAL D.O.C912	Kalle (091)	
Reyor's public o	7:50	(018)	econg wear
Field Screening Results: (Hach Ferro	ous Iron)	<del></del>	
		<del></del>	

SAMPLER(S) SIGNATURE:



SAMPLER(S) SIGNATURE:

	TAL   FACILITIES   LO	OGISTICS	<u> </u>	HOUND	WATER	SAMP	LING L	UG		
ITE NAM	E: Smokey	Mountain Sr	nelter Site	SITE LOCA	TION: Knox	ville, Tenne:	ssee	· .	DATE:	23-14
WELL NO: MW7B SAMPLE ID:								SAMPLE TIN	1E: 12245	
		NS/ GENER	AL OBSERVA	TIONS:				<u> </u>		
					PURGING I	DATA				
/ell Type:			Pump: (S/N):	-	4611				Total Well De	pth (feet):
Well Diameter (inches): 2 Water Quality Meter: (S/N): R7431										al (feet)
ubing Dia 16ID x 0. ubing Mat		s):	,	ter: (S/N): 🕻 Indicator: (S/ſ	10966	12311	LUIS 4	81)	Static Depth   20; Tubing Depth	to Water (feet)
TFE (Tefl	on)				1280	8			35	<b>3</b>
WELL VO	OLUME PUF feet		al Well Depth feet) X	<ul> <li>Static Deptigation</li> </ul>	n to Water) X ns/foot =	Well Capaci	ty gallons			Purged (gallons Purged (gallons
urge Met	hod: Traditio	nal Multiple	Volume Purge	("Sipping fron	n the Top") or l	ow-Flow ("T	ubing in Mid	Screen")	20	, argea (ganerio
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp.	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP *	Turbidity (NTUs)	Odor/ Color Observation
130	.185	425	2013	20143	75.96	160	6121	1718	56,2	
135	1285	125	20.15	7067	76.4S	.53	6,17	176	9113	
140	,125	+375	20.26	20,71	76-74	-44	6.14	181	95	
45	.125	,50	20.30	20.83	7696	136	616	183	26.1	
150	1125	,625	2036	20.91	7742	133	616	184	70.3	
55	1175	.75	20.30	2198	19:01	129	615	187	1819	
200	1125	1875	10.4)	2251	80.07	121	617	197	14,4	
205	1725	1,0	20.30	23.33	81,82	"Z9	6118	193	8156	
210	.125	11125	20.34	23/10	81:00	131	6118	196	7,26	
213	1725	1.25	2034	23,00	86,94	<i>38</i>	6119	199	6.76	
220	1125	1,375	20.34	27.92	180.88	431	648	199	4,15	·
US	125	1:5	26.35	27.99	80.79	-26	6.18	199	4122	
13 J	.125	1.675	70.3S	23,13	80,81	,25	6.19	199	4,50	
235	6125	1.75	25.35	23119	81.08	26	6118	1955	45	
240	1125	1.875	20:35	23.16	81,10	125	6,19	198	6.0	
245	14 C	20	7035	23.10	8112	.24	6,19	198	710	
	···									
bing insid		apacity (Gal/Fi	t): 1/8" = 0.000	06; <b>3/16</b> " = 0.0	2" = 0.16; 3" = 014; 1/4" = 0.0 l Oxygen: <u>+</u> 0.2 n	026; 5/16" =	0.004; 3/8" =	0.006; 1/2" =	.47; <b>12"</b> = 5.88 0.010; <b>5/8"</b> = 0.0 Turbidity: <10 N	116
	· -	<del></del>	·	FIELD	SCREENING	SUMMAF	RY	<u> </u>	<del></del>	
eld Filtere	d: Yes/No	Filter Siz	e: Duplic	cate: Yes/No	Duplicate g, description of	ID:	Time	:	MS/MSD:	Yes/ No
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anaval N	-4 (141-P				futur 0.45°	3		· ·		· · · · · · · · · · · · · · · · · · ·
eneral No			conditions, rea . F&		on from SAP/I	a .	@ (c	ત્રુડ	12:3	Ø
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Page 2 of 8



ENVIRONMENTAL   FACILITIES   LOGISTICS	G	ROUND	WATER	SAMP	LING L	OG	<u>.                                    </u>	
TE NAME: Smokey Mountain S	Smelter Site	SITE LOCA	ATION: Knox	ville, Tennes	see		DATE: 6	23.14
WELL NO: 1 SAMPLE ID:								1E:1305
EATHER CONDITIONS/ GENEI	RAL OBSERVA	TIONS:						<del></del>
	т		PURGING	DATA	14.		<del>r </del>	· <del></del>
ell Type:	Pump: (S/N)	00		- 1			Total Well De	pth (feet):
ell Diameter (inches):	Water Qualit	y Meter: (S/N	): <del>  \</del>	127	(45)		Screen Interv	ral (feet)
ibing Diameter (inches):	Turbidity Me	ter: (S/N):	18981	ž				to Water (feet)
16ID x 0.25OD ibing Material:	Water Level	Indicator: (S/I	N): 128	25/		i	Tubing Deptr	n (Begin/End)
rfE (Teflon)							<u> </u>	
WELL VOLUME PURGE = (To ( feet -	otal Well Depth feet) X		h to Water) X ons/foot =	Well Capacit	y gallons	-	Volume to be	Purged (gallons):
i <b>rge Method:</b> Traditional Multiple	e Volume Purge	("Sipping from	n the Top") or l	Low-Flow ("Te	ubing in Mid :	Screen")	Total Volume	Purged (gallons):
Volume Total Volume Purged (gal	Depth to Water (feet)	Temp.	Specific Conductance ms/cm or	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
200 -725 1125	पि:पट	15-71	μS/cm	« I I	519	-191	34.0	
105 -184 .250	9,50	18.45	1290	.08	8.75	-708	51,3	
10 ,125 ,375	16.10	18.72	1229	PO	8,26	-205	3613	
215 -13 50	10.90	19.09	11.93	02	8.28	-187	17.9	
120 -175 -675	10.96	19.15	1(86	03	8.28	-189	1119	<del></del>
30 .115 -75	10.96	19616	11.74	-04	€,30 €,33	-191	10.7 CVX	
35 125 40	10.90	1919	11.68	03	8.36	-196	3.0	<del></del>
X 0 (125 1)125	10.90	1947	11.65	101	\$.37	-196	6.65	
45 125 1.25	10,9	18.85	11.57	.0	8:37	-196	6.05	
50 125 1,395	40,90	18.58	11.33	~0/	8139	-186	3,39	
55 .25 1.50	10.90	18.87	11.37	01	8.37	-175	247	
05 ,25 1,7	10.90	10-86	11.37	01.	8.37	17)	7/6 >0	
0) 1103 110	1090	1821-	11.73		0.77	1/3	3.0	<del></del>
					<u> </u>			
	<u> </u>							
bling Inside Diameter Capacity (Gal. bilization Criteria Range: Specific	2; 1" = 0.04; (Ft): 1/8" = 0.000 Conductance: ± 6	06; <b>3/16</b> " = 0.0	0014; 1/4" = 0.0	026; 5/16" = 0	0.004; 3/8" = 0	0.006; 1/2" =	1.47; <b>12"</b> = 5.88 0.010; <b>5/8"</b> = 0.0 <b>Turbidity</b> : <10 N	016
<u></u>	<del></del>	FIELD	SCREENING	SUMMAR	Υ		<del></del>	· · · · · · · · · · · · · · · · · · ·
eld Filtered: Yes/No Filter S		cate: Yes/No	Duplicate	ID:	Time	· ·	MS/MSD:	Yes/ No
				F014912F	ou o <b></b> 0,0**/			
eneral Notes: (Well observations	s/ conditions, res	ason if deviat	ion from SAP/ I	Protocol)				
eld Screening Results: (Hach F	errous Iron)							<del></del>
. (1	O1 (							į.
			<del></del>		<u>-</u> <u>-</u> -			<del></del>
AMPLER(S) SIGNATURE:	.06	/			<del></del>			<del></del>



VISION   ENVIRONMENTAL   FACILITIES   LOGISTICS	GROUNDWATER SAMPLING	G LOG
SITE NAME: Smokey Mountain	Smelter Site SITE LOCATION: Knoxville, Tennessee	DATE: 6, 24
WELL NO: WWIL	A SAMPLE ID:	SAMPLE TIME: 7:55
WEATHER CONDITIONS/ GEN	ERAL OBSERVATIONS:	
<u> </u>	PURGING DATA	
Well Type:	Pump: (S/N): 024611	Total Well Depth (feet):
Well Diameter (inches):	Water Quality Meter: (S/N): 1127431	Screen Interval (feet)

Turbidity Meter: (S/N): [S95] Static Depth to Water (feet)
Tubing Depth (Begin/End) Tubing Diameter (inches): 3/16ID x 0.25OD Tubing Material: Water Level Indicator: (S/N): PTFE (Teflon) 1 WELL VOLUME PURGE = (Total Well Depth - Static Depth to Water) X Well Capacity Volume to be Purged (gallons): feet feet) X gallons Total Volume Purged (gallons):

Purge Method: Traditional Multiple Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")

Time	Targe met				( c.ppgc						
145 1256 8.01 1716 6.297 128 662 99 140 150 1375 8.01 17.54 8.456 121 8.63 - 137 1 97 155 1560 6.01 1821 8.550 7 1 5162 - 1377 86 1675 8.01 1822 8.679 - 29 8.62 - 1377 86 170 1875 8.01 1823 8.600 . 36 8.60 4371 50 1823 8.600 . 36 8.60 4371 46.9 170 8.65 4375 8.01 1824 8.601 . 40 8.60 40 71 46.9 170 8.65 8.60 40 71 1800 8.821 117 8.65 71.7 28.8 175 1125 8.01 1800 8.821 117 8.65 71.7 28.8 175 1125 8.01 19100 8.821 117 8.65 71.7 28.8 175 11350 8.01 19100 8.861 . 17 8.65 71.7 28.8 175 1150 8.01 19100 8.861 . 17 8.65 71.7 28.8 175 1150 8.01 19100 8.861 . 17 8.65 71.0 25.1 1800 8.821 117 8.65 71.0 36.0 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70.6 1800 70	Time	Purged (gal	Purged	Water (feet)	Temp. (°C)	Conductance ms/cm <u>or</u> µS/cm	Oxygen	(standard			
150 137) 801 1754 846 121 863 197 197 155 1500 801 1821 8550 7 1 865 -1077 86 170 1675 801 1822 8679-29 862 -1077 86 170 1750 800 1823 8600 36 860 4071 469 170 8150 8101 1867 8808 19 860 4071 469 1750 8101 1867 8808 19 860 4071 37.00 1825 8101 1867 8808 19 860 71,7 288 1750 1750 8101 1800 8821 117 8160 71,7 288 1750 1750 8101 19100 8861 17 8160 71,5 251 1750 8101 19100 8861 17 8160 71,5 251 1750 8101 19100 8861 17 8160 71,5 251 1750 8160 1916 8160 71,0 1819 1750 1750 8101 1916 8975 180 8160 7016 1819 1750 1750 8101 19165 8101 1916 8160 71,0 1010 1010 1010 1010 1010 1010 101	180	1125	125	8,01	1707	8.28	~48	8,60	116,3	148	
155 1500 C.O. 1821 8550 Z 1 8162-1077 86  700 1675 \$ 101 1822 C.6 \$1 .700 \$162 - 1076 71  705 1750 8 10 1823 8 .600 .36 8 .60 \$1 9 .71 \$1.70  710 1875 8 10 1823 8 .600 .36 8 .60 \$1 9 .71 \$1.70  715 1125 8 10 1 1867 8 .808 .19 \$1.60 \$1.71 \$1.70  775 11250 \$ 101 1800 8 .821 .117 \$1.60 \$1.71 \$1.70  775 11250 \$ 101 1800 8 .821 .117 \$1.60 \$1.71 \$1.70  735 11375 8 10 1 19100 8 .861 .17 \$1.60 \$1.71 \$1.50  740 11675 \$101 1918 \$975 , 16 \$1.60 \$71.0 \$2.00  740 11675 \$101 1916 9.000 .14 \$1.60 \$71.0 \$1.00  740 11675 \$101 1916 9.000 .14 \$1.60 \$71.0 \$1.00  740 11675 \$101 19165 \$1.001 .16 \$1.60 \$71.0 \$1.00	145			801		6.297	SSI	862		140	
700 1675 \$101 1822 \$1641.700 \$162 -1076 71  705 1750 \$101 1823 \$1600 .36 \$160 4071 \$16.9  710 1875 \$101 1823 \$1600 .36 \$160 40168 3910  710 1125 \$101 1867 \$1808 .19 \$160 40168 3910  775 11250 \$101 1800 \$1821.117 \$160 71.7 \$25.7  775 11250 \$101 1800 \$1821.117 \$160 71.7 \$25.7  730 11375 \$101 19100 \$1861.17 \$160 71.5 \$25.7  735 1150 \$101 19100 \$1861.17 \$160 71.0 70.6 1814  740 11675 \$101 1916 \$1900 .18 \$160 71.0 10.0  745 11350 \$101 19165 \$1001 .16 \$160 71.0 911	150		<u>,37&gt;</u>	801	17.54	5,436	121			192	
705 1750 800 1823 8600 36 860 4071 4619  710 (875 80) 1823 8600 36 860 4071 4619  715 1,00 800 1824 8661 40 8160 4068 3910  775 1750 801 1800 8821 117 860 71,7 2818  775 1750 801 19100 8861 17 8160 71,5 251)  735 1150 8101 1918 8975 18 8160 7616 1814  740 11675 8101 1916 9000 181 8160 71,0 1800  745 1,350 801 19165 9001 16 8160 71,0 911	155		1500	6,01	1821		71		-10 17	86	
710 (875 & 0) (823 & 600 , 36 & 60 & 71 46,9  2(S) 1,00 & 0) (874 & 661 , 40 & 160 & 390 \\  770 1,125 & 101 1867 & 8,808 , 19 (-6) & 171 37,0 \\  775 1,250 & (0) 1800 & 821 , 17 & (60 71,7 28) \\  730 1,375 & (0) 19100 & 861 , 17 & (60 71,5 25) \\  235 1,50 & (0) 1918 & 975 , 16 & 160 76,6 1844 \\  740 1,675 & (0) 1966 & 900 , 18 & 60 71,0 900 \\  745 1,350 & (0) 1966 & 900 , 16 & 860 71,0 911 \\  750 1,383 (8) 1965 900 , 16 & 860 71,0 914	700		1675	5,001	1821	5,641	150	862		71	· · · · · · · · · · · · · · · · · · ·
7(5) 1,00 \$101 1874 8661 190 8160 4068 3910 770 1,125 8101 1867 8.808 19 (6) 4071 37.0 775 1050 8101 1800 8.821 117 8160 71,7 2818 730 1,375 8101 19100 8.861 17 8160 71,5 251) 23 5 1,50 8101 1918 8975 18 8160 7616 1814 740 11675 8101 1916 9100 18 8160 71.0 10.0 745 1,350 8101 1916 91001 16 8160 71.0 911	705		7 17	8(0)	1823	6679	-29	8161			
7(5) 1,00 8,0) 1824 8661 470 8:60 4068 39:0  770 1,1125 8:01 1867 8:808 19 8:61 71 37.0  775 11250 8:01 1800 8:821 1.17 8:60 71.7 28:8  730 1,375 8:01 19:00 8:861 1.17 8:60 71.5 25:1  23 5 1:50 8:01 19:18 8975 18 8:60 76:6 18:4  740 1:675 8:01 19:66 9:001 16 8:60 71.0 9:1  750 1833 (8) 19:65 9:001 16 8:60 71.0 9:1	710			80)	1823	8,600	./56	8,60	4071	46,9	
775 1780 8.01 1800 8.821.117 8.60 71.7 28.8 730 1,375 8.01 19100 8.861.17 8.60 71.5 25.1 235 1,50 8.01 1918 8975 18 8.60 70.6 18.4 740 1,675 8.01 19.61 9.000 14 8.60 71.0 10.0 745 1,350 8.01 19.66 9.001 16 8.60 71.0 911	715	·	1.00		1824	8661	470	- 12 M	40168	3900	
736 1,375 810 ) 19100 8 861 17 8160 71,5 25,1 23 5 1,50 810 ) 1918 8975 18 8160 76,6 1814 740 1,675 8101 1916 9.000 181 8160 71.0 10.0 745 1,350 8101 1916 91001 16 8160 71.0 914	770		11125	8101	1867	808.8	19	5.61	4171	37.0	
235 1,50 8,0) 19,18 8975 ,18 8,60 70,6 18,4 710 1,675 8,0) 19,61 9,000 ,18 8,60 71,0 10,0 245 1,750 8,01 19,66 9,001 ,16 8,60 71,0 9,1 750 3835 C. 81 19,65 9,000 ,16 8,60 71,0 9,4	775		17250	8:01	1800		.117	260	71,7	26/2	
740 1,675 8,01 19.61 9.000 . 18 8,60 71.0 10.0 745 1,750 8,01 19.66 9,001 , 16 8,60 71.0 9,1	236		1,375	8101	19100	8.861	7	8160	71,5	نځک	
750 783 6.01 19.65 9.000 .16 8.60 71.0 914	235		)150	8.01	19,18	8975	185	8,60	70,6	187	
750 783 6.01 19.65 9.000 .16 8.60 71.0 914	740		1,675	810)	19.61	9.000	1	860	71.0	100	
	24S		1,250	8.01	1.77	9,001	16	8160	710	0	
	750		1835	(,0)	19/165	9,000	:16	8,60	740	904	
	ŽS \$		2.6	2.01			. 17	5,60	760	20	
				<u> </u>					, ,		

Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance:  $\pm 5\%$ ; Dissolved Oxygen:  $\pm 0.2$  mg/L or 10% saturation, pH:  $\pm 0.1$  unit; Turbidity: <10 NTU

				1
Field Filtered: Yes/ No Filter Size:	Duplicate: Yes/ No	Duplicate ID:	Time:	MS/MSD: Yes/ No
PHOTO LOG: (Photo number, time/date, dire	ection photo is facing,	description of photograp	hed subject)	
				And the second
		·		
General Notes: (Well observations/ conditions)	ns, reason if deviation  A Pacar	from SAP/ Protocol)	6124 @	1446
Field Screening Results: (Hach Ferrous Iro	n)			
·	·			<u></u>
SAMPLER(S) SIGNATURE:				<del></del>

### **SMOKEY MOUNTAIN SMELTERS**

Knoxville, Knox County, Tennessee

June 2014

Quarterly Event 4
Remedial Investigation / Feasibility Study

Groundwater Sampling Log
Book 2 of 3



MANAGING THE VISION® | ENVIRONMENTAL | FACILITIES | LOGISTICS



MANAGING THE VISION? I ENVIRONMENTAL I FACILITIES I LOGISTICS

**INSTRUMENT AND CALIBRATION LOG** 

Site Name:

		Calibration		Verification			Instrument Type and	1	Calibration	] "
Date	Parameter	Value	Time	Response	Time	Signature	Manufacturer	Serial Number	Standard Lot	1
0/0/0	example ORP call and verification	240 mV	803	238.7	813	Signature	Example/Example	Pine 010111	N6L77-8	
0/0/0	example pH 7 verification			6.98	1752	Signature	Example/Example	Pine 010111	M6A84-2	} .
6/23/14	_D_	97.2%	0729		<u> </u>	AG	YS1 532 mps	PINE 14825		]
R	COND	1.4/3	0744	1.430	0922	AG			1070\$	1.573
ŧı _	PH7	7.0	0753	6.36	0324	Ala			2306880	7.45
i i	Pity	Ý.o	0815	396	0825	Als			2370A78	12.45
13	めんや	240.0	0819	240.0	0830	AG			5245	224.3
6/25/14	DO		0865	100%	10208	000	1 / SISCOURS	PINEBULG	10204	100
	CIMO		808A	1.413	ONT			1	23070840	1.430
	OH 7	7.05	289C	7,00	6825				23/04 78	7.03
	144	4.02	795	4.00	10777				₹.245	7.03
	TORP	39.6	4180	240 (	1820			- سائد	1	
	100		<u>ত</u> ্বিলে ্	11500%	GRUT			PINER7341		1
	COND		0809	1,412	MR			ì		1.227
	pH =	7.03	/汉/2	7.50	OSF		1			7 01
	12H 4	4.02	R814	4,00	1818	1				1.237 7.06 4.23
	CRV	135.3	050	240	0821	N. Committee			- <del> </del>	7.00
			- <del></del>					<del>                                     </del>		
		1			1			f		1
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L	<del></del>			<u></u>		<del></del>	<del></del>	<del></del>	<del></del>	J

Each instrument will be calibrated using calibration standards provided by the manufacturer or instrument vendorat the beginning of each work day, after battery replacement during each work day, after sensor maintenance during each work day, and after a failed calibration verification. Calibration consists of stabilization and electronic "spanning" of the instrument/sensor resposne to the calibration standard set via instrument software and manufacturer's instructions. Calibration verification consists of stabilization of the instrument/sensor with the calibration standard set to verify response within +/- 10% of the calibration standard set value. Calibration verification will be performed immediately following calibration, at the end of each instrument use period (ie before turning the instrument off), at initiation of instrument use after restarting (ie after turning the instrument on after a shutdown during the work day), at any time during the work period when instrument readings are suspect, and at any time directed by the FOL. Include the unit of measure, i.e. "mV", "S.U.", "NTU", etc. in the calibration value column. THE FOL WILL REVIEW THIS CALIBRATION LOG AND COMPLETE THE FORM WITH HIS/HER SIGNATURE AT THE END OF EACH WORK DAY.

FOL Name:	FOL Signature:



		<del></del>
SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 6/23/14
WELL NO: 5MS MWIZA	SAMPLE ID: SMS MW1219	SAMPLE TIME: 1330
WEATHER CONDITIONS/ GENERAL OBSERVA	TIONS:	

		MWI Z		SAMPLE II	); <u>)/"\S</u>	MWIZ	M		SAMPLE TI	ME: [350
WEATHER	CONDITIO	INS/ GENERA	AL OBSERVA							<del></del>
Well Type:	(3.4	<del></del>	Pump: (S/N):	0	PURGING !				Total Well D	enth (feet)
Well Type:	• •			1,200	€ 021°	17 6	50 208		)	34.10
	eter (inches)				): 45158				Screen Inter	val (feet)
Tubing Dia 3/16ID x 0	meter (inche	es):	Turbidity Met	ter: (S/N): } <del>}</del>	net 2100	Q Pm	EH ZO	345		to Water (feet) 3フェン
Tubing Ma			Water Level	Indicator: (S/I	v): <	INIST "	PINES	·	Tubing Depti	h (Begin/End)
PTFE (Tef				•	Juc	103(	1	16417	23	
1 WELL V	OLUME PUR	RGE = (Total	t al Well Depth	- Static Dept	h to Water) X	Well Capacit	·			Purged (gallons):
= (	feet	=	feet) X	gallo	ns/foot =		gallons		•	Purged (gallons):
Purge Met	hod: Tradition	onal Multiple	Volume Purge	("Sipping fron	n the Top") or t	_ow-Flow ("Ti	ubing in Mid S	Screen")		
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp.	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
69/3	0.25	0.25	37.39	18.93	184	1.68	6.61	1306	117	CrowDy
2730		0.5	37.61	20.26	1.857	1.5	6.46	72.0	33.1	er
7940	0.25	0.75	74	20.60	1.852		6.47	68.2	18.2	CIEBR
0157	0.5	1.25	738.00		1.857	0.44	List	26.0		11
				1 1 7 1	(30)	<del></del>	6.40			
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Well Capaci Tubing Insid Stabilization	de Diameter C	apacity (Gal/F	; 1" = 0.04; t): 1/8" = 0.000 onductance: ± 5	06; 3/16" = 0.0 i%; Dissolved	014; 1/4" ≃ 0.0 i Oxygen: <u>+</u> 0.2 r	026; <b>5/16</b> " = 0 ng/L or 10% sat	0.004; <b>3/8"</b> = 0 turation, <b>pH</b> :	0.006; <b>1/2"</b> =	1.47; <b>12"</b> = 5.88 0.010; <b>5/8"</b> = 0 <b>Turbidity</b> : <10 N	.016
	PR	65	, -	FIELD	SCREENING	SUMMAR	Y		<del>-,</del>	
Field Filter PHOTO LO	ed: (Photo n	Filter Siz umber, time/	e: Duplidate, direction	cate: Yes/No photo is facin	Duplicate g, description of		Time: ed subject)	<del></del>	MS/MSD:	Yes No
General N	otes: (Well o	observations/	conditions, rea	_	on from SAP/I	•	23 13	551	Faci	Υ) ά
			- 1		S. 0.0.		, <del>13</del>	+	<u> </u>	WE W
Fleid Scre	ening Resul	lts: (Hach Fe	rrous Iron)	<del>-,</del>				100	<u> </u>	
	3.04	m	9/L							
		7	- 1 - 4 - V							



SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 6/23/14
WELL NO: SMSMW12B	SAMPLEID: SM 5 MW 12B	SAMPLE TIME:
WEATHER CONDITIONS/ GENERAL OBSERVA	TIONS:	

	PURGING DATA	
Well Type: PUC	Pump: (S/N):	Total Well Depth (feet):6 (
Well Diameter (inches): 2	Water Quality Meter: (S/N):  SAME AS  PREVIOUS	Screen Interval (feet)
Tubing Diameter (inches):	Turbidity Meter: (S/N):	Static Depth to Water (feet)
3/16ID x 0.25OD		
Tubing Material:	Water Level Indicator: (S/N):	Tubing Depth (Begin/End)
PTFE (Teflon)		255
1 WELL VOLUME PURGE = (Total	al Well Depth - Static Depth to Water) X Well Capacity feet) X gallons/foot = gallons	Volume to be Purged (gallons):
Purge Method: Traditional Multiple	Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	Total Volume Purged (gallons):

Time	Volume Purged (gal	Total Volume Purged	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
1028	0.5	(gal)	31.02	17.67	2641	1-32	7.87	1269	71000	TAN/OPAGE
1038	0.5	1.0	37.02	17.97	2448	0.51	7.18	1068	788	Ecos D4
10 44	0.5	1.5	37.03	17.66	2.371	0.45	7.15	40.7	118	(4 /
1055	05	2-8	31.07	17.55	2.222	0.35	7-11	90.7	74.4	64
1101	0.5	7.0	37.02	17.69	2.143	0.30	716	89.3	54.6	
1115	1.0	4-0	37.07	17.55	1.994	0.30	2-11	90.3	46.6	11
1126	0.5	4.5	37.02	18.09	1.975	0.25	7.14	876	57.3	91
1136	0.5	5.0	37-02	1793	1.974	0.22	7.16	86.2	63.3	<b>'</b> t
1150	100	6.0	37.02	18.21	1.960	0.19	2.17	84.5	62.9	4 4
1207	1.0	7.0	37.02	18.10	1.950	0.17	7.17	81.2	53.3'	· · · · · · · · · · · · · · · · · · ·
1224	10	3.0	31.02	18.33	1.934	0.16	7.19	77.5	54.6	€€
1246	ြ	9.2	37.02	18.41	1928	0.15	7.20	75-6	56.95	
`										

Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU

Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU	
FIELD SCREENING SUMMARY	
Field Filtered Yes No Filter Size: Duplicate: Yes No Duplicate ID: Time: MS/MSD: Yes/No	-
PHOTO LOG: (Photo number, time/date, direction photo is faeing, description of photographed subject)	
General Notes: (Well observations/ conditions, reason if deviation from SAP/ Protocol)	<b>1</b>
TURBIDITY REMAINED HIGH DESPITE LONG SLOW PURCE.  DHOTO: 25 DON-OLD-23 13.16	.03 Facing
Field Screening Results: (Hach Ferrous Iron)	FOCING
3.28	1.50.7
SAMPLEM(S) SIGNAPURE:	- ]. ,
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		<del>-</del>
SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 6/25/14
WELL NO: MWORA	SAMPLE ID: MWD'SA	SAMPLE TIME: 10 15
WEATHER CONDITIONS/ GENERAL ORSERVA	ATIONS	

	PURGING DATA	
Well Type: PVC	Pump: (S/N): 024611	Total Well Depth (feet):
Well Diameter (inches):	Water Quality Meter: (S/N): 02 11 61 9	Screen Interval (feet)
Tubing Diameter (inches): 3/16ID x 0.25OD	Turbidity Meter: (S/N): #398	Static Depth to Water (feet)
Tubing Material: PTFE (Teflon)	Water Level Indicator: (S/N): 904017	Tubing Depth (Begin/End)
	(Total Well Depth - Static Depth to Water) X Well Capacity	Volume to be Purged (gallons):
= ( feet -	feet) X gallons/foot = gallons	Total Volume Purged (gallons):

Purge Met	t <b>hod:</b> Traditi	onal Multiple	Volume Purge	("Sipping fror	n the Top") or I	6w-Flow ("Th	ibing in Mid (	Screen")	10.01 10.0110	r arges (ganorie).
Tíme	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
0732	0.50	0.50	24.83	17.79	6.3L9	0.81	8.54	188.6	435	brown
0938	5.1	1.50	24.89	19.07	6.437	0.21	8.58	\$5. (	164	brownish
0945	1.0	2.50	24.99	18.06	6.517	6.13	8:60	19.5	55	cloudy
2125	1,0	3.50	25.02	19.02	6.557	0.12	8.61	8.3	23,2	7
6958	[.D	450	25.07	18.05	6.585	6.10	8.62	-2,3	14.5	
003	0.5	5.0	25.08	18.04	6.622	0.25	8.60	3.6	2.87	
1007	0.50	5.50	25.11	18.05	6.659	6.09	8.62	-185	8.80	
1010	0.50	6,00	25.14	18:01	6.686	0.03	362	-26.0	8.41	
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Well Capacity (Gal/Ft): 0.75'' = 0.02; 1'' = 0.04; 1.25'' = 0.06; 2'' = 0.16; 3'' = 0.37; 4'' = 0.65; 5'' = 1.02; 6'' = 1.47; 12'' = 5.88 Tubing inside Diameter Capacity (Gal/Ft); 1/8'' = 0.0006; 3/16'' = 0.0014; 1/4'' = 0.0026; 5/16'' = 0.004; 3/8'' = 0.006; 1/2'' = 0.010; 5/8'' = 0.016 Stabilization Criteria Range: Specific Conductance:  $\pm 5\%$ ; Dissolved Oxygen:  $\pm 0.2$  mg/L or 10% saturation, pH:  $\pm 0.1$  unit; Turbidity: <10 NTU

#### FIELD SCREENING SUMMARY

Field Filtered: Yes/No Filter Size:	Duplicate: Yesi/No	Duplicate ID:	Time:	MS/MSD: Yes/Mo
PHOTO LOG: (Photo number, time/dat	e, direction photo is facing,	description of photog	graphed subject)	
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General Notes: (Well observations/ co	ngitions, reason it deviation	Trom SAP/ Protocol	)	
			•	
Field Screening Results: (Hach Ferro	us Iron)	<u> </u>		
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		0.00		
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SAMPLER(S) SIGNATURE:	1	AL.		



SAMPLER(S) SIGNATURE:

#### **GROUNDWATER SAMPLING LOG**

SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 6/25/14					
WELL NO:	SAMPLE ID: MW13B	SAMPLE TIME: 1419					
WEATHER CONDITIONS/ GENERAL OBSERVATIONS:							

WELL NO: SAMPLE ID: PW 13 B SAMPLE TIME: 14(9)										
WEATHER CONDITIONS/ GENERAL OBSERVATIONS:										
					PURGING	DATA				
Well Type:	PYL	<del></del>	Pump: (S/N)	:		ne As	Previous	<u> </u>	Total Well De	epth (feet): 72.85
Well Diameter (inches): Water Quality Meter: (S/N):								Screen Inter		
Tubing Dia	meter (inche	-s):	Turbidity Me	ter. (S/N):						to Water (feet)
Tubing Ma			   Water Level	Indicator: (S/I	N):	11/	<i></i>			h (Begin/End)
PTFE (Tef				,	•	$\mathcal{V}$			6	
1 WELL V	OLUME PUE	RGF = (Tot	al Well Depth	- Static Dept	h to Water) X	Well Capacit	v .			Purged (gallons):
= (	feet		feet) X		ens/foot =		gallons		<b>,</b>	e Purged (gallons):
Purge Met	thod: Tradition	onal Multiple	Volume Purge	("Sipping from	n the Top") or (	Ow-Flow (1)	ubìng in Mid S	Screen")	Total volume	Purged (galloris):
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp.	Specific Condustance (me/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
1313	6.50	0.50	37.35	17.35	0.726	332	6.96	203	38.1	clear
1324	1.0	1.50	37.31	18.52	0.710	0.3	6.89	178	33.8	
1333	0.50	2,0	37.32	18.34	0.721	0.26	6.37	150.1	27.1	
1338	0.50	2.50	3732	18.01	0.726	0.28	6.86	120.3	73. (	
1356	1,50	11.00	\$1.32	18.38	0.743	6.52	6.86	82	14.5	
1410	10	5.0	37.35	17,74	0.147	0,17	6.95	42.5	8.44	
1415	٥٠.٥٠	2.50	37.35	18.56	0.755	0.19	6.84	48.9	7.45	
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Tubing Insid	de Diameter C	apacity (Gal/F	t): 1/8" = 0.000	06; 3/16" = 0.0	2" = 0.16; 3" = 0014; 1/4" = 0.0 1 Oxygen: ± 0.2 r	026; <b>5/16</b> " ≃ (	0.004; <b>3/8</b> " = 6	D.006; 1/2" =	1.47; 12" = 5.88 0.010; 5/8" = 0. Turbidity: <10 N	.016
			<u> </u>	FIELD	SCREENING	SUMMAR	Υ			
Field Filter	ed: YeskNo	Filter Siz	e: Dupli	cate: Yes/No	Duplicate	ID:	Time		MS/MSD:	(es/No
PHOTO LO	OG: (Photo n	umber, time/	date, direction	photo is facin	g, description o	of photograph	ed subject)			
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General Notes: (Well observations/ conditions, reason if deviation from SAP/ Protocol)										
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Field Scre	ening Resul	ts: (Hach Fe	rrous Iron)			204	1			
1						0.04				
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Page 4 of 8

## MOKEY MOUNTAIN SMELTERS

Knoxville, Knox County, Tennessee

June 2014

Quarterly Event 4
Remedial Investigation / Feasibility Study

Groundwater Sampling Log
Book 3 of 3



MANAGING THE VISION® | ENVIRONMENTAL | FACILITIES | LOGISTICS



MANAGING THE VISION* | ENVIRONMENTAL | FACILITIES | LOGISTICS

#### **INSTRUMENT AND CALIBRATION LOG**

Site Name:

Site Nam	<del>~-</del>	Calibration		Verification		<del> </del>	T			,
Date	Parameter	Value	Time	Response	Time	Signature	Instrument Type and Manufacturer	Serial Number	Calibration Standard Lot	
0/0/0	example ORP cal and verification	240 mV	803	238.7	813	Signature	Example/Example	Pine 010111	N6L77-8	
0/0/0	example pH 7 verification			6.98	1752	Signature	Example/Example	Pine 010111	M6A84-2	
6/24	DO	97.4	0711			14.	Y51 556	020609		
	Conductivity	1.410	0313	1.473	1705	1		]	3AI 36Z	
	PH 7	7.22	6717	6.90	1703				2306880	
	PH ID	7,95	0920	9.86	1711				2310884	
W	ORP	216	0925	234.8	1714			# T	5245	*
0176	Dogo		0800	100.0	PRIS	on	R457586	27341-	1:	
	CONCLUCTIVITY_	1,428	0805	1.412	1808			1	10704	1.492
	PHO	16.35	M8 15	7.00	08/3				2306880	7.68
	DH4	5/15	0813	4.00	08/5	,			JUDION TR	4.25
	MEP	23918	CFIS	DNO.	05/7c	-	V	N	5245	AH.A
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Each instrument will be calibrated using calibration standards provided by the manufacturer or instrument vendorat the beginning of each work day, after battery replacement during each work day, after sensor maintenance during each work day, and after a failed calibration verification. Calibration consists of stabilization and electronic "spanning" of the instrument/sensor resposne to the calibration standard set via instrument software and manufacturer's instructions. Calibration verification consists of stabilization of the instrument/sensor with the calibration standard set to verify response within +/- 10% of the calibration standard set value. Calibration verification will be performed immediately following calibration, at the end of each instrument use period (ie before turning the instrument off), at initiation of instrument use after restarting (ie after turning the instrument on after a shutdown during the work day), at any time during the work period when instrument readings are suspect, and at any time directed by the FOL. Include the unit of measure, i.e. "mV", "S.U.", "NTU", etc. in the calibration value column. THE FOL WILL REVIEW THIS CALIBRATION LOG AND COMPLETE THE FORM WITH HIS/HER SIGNATURE AT THE END OF EACH WORK DAY.

FOL Name:	FOL Signature:



SOCIATES, I	NC. Intal   facilities   Lo	OGISTICS	G	ROUNE	WATER	SAMP	LING LO	)G		
		Mountain Sn	nelter Site	SITE LOC	ATION: Knox	ville, Tennes	see		DATE: lol	24/14
WELL NO: MW 10 A SAMPLE ID: MW 10 A							SAMPLE TIM	IE:		
WEATHER CONDITIONS/ GENERAL OBSERVATIONS: Pastly (budy go										
1-11 7-1-1					PURGING				· T = 1 (1) (1)	
/ell Type:	, -		l e		121 sul	-	e		Total Well De	pth (feet): • 6 3
/ell Diam	eter (inches):	2	Water Qualit	y Meter: (S/N	): 0206	09			Screen Interv	al (feet)
•	meter (inche	s):	Turbidity Me	ter: (S/N);					Static Depth t	o Water (feet)
16ID x 0 ubing Ma TFE (Tef	iterial:		Water Level	Indicator: (S/	N): 9038	27			Tubing Depth	
(29	63 feet	-28.72	feet) X C	116 gallo	th to Water) X ons/foot = m the Top") or I		gallons	creen")	[	Purged (gallons): Purged (gallons):
Time	Volume Purged (gal	Total Volume Purged	Depth to Water (feet)	Temp.	Specific Conductance ms/cm or	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
	(9	(gal)		<del> </del>	μS/cm				<del> </del>	<del></del>
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bing İnsid			): 1/8" = 0.000	6; <b>3/16</b> " = 0.0	2" = 0.16; 3" = 0014; 1/4" = 0.00 d Oxygen; ± 0.2 n	026; 5/16" = 0	.004; 3/8" = 0	.006; 1/2" =	1.47; 12" = 5.88 = 0.010; 5/8" ≃ 0.0 Turbidity: <10 N	
			·	FIELD	SCREENING	SUMMAR	<u>Y</u>		<del></del>	·
	ed: Yes/No OG: (Photo no		e: Duplic	cate: Ved No photo is facin	Duplicate g, description o		ic A Time: ed subject)		MS/MSD:	Yes/No
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	1		-		on from SAP/F	•	pped. L	saiteo	d 10 min	and nothin
	<u>_</u>	ts: (Hach Fer			<del></del>	<del></del> -			<del></del> -	<del></del>
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MPLER	(S) SIGNATI	JRE:								



SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 6/24/14					
WELL NO:	SAMPLE ID: MWIOG	SAMPLE TIME: 1152					
WEATHER CONDITIONS/ GENERAL OBSERVATIONS:							

	PURGING DATA	
Well Type: PV C	Pump: (S/N):  Wafer Quality Meter: (S/N): See- Previous Palbye	Total Well Depth (feet):
Well Diameter (inches): 2.かへ	Water Quality Meter: (S/N): See- Previous	Screen Interval (feet)
Tubing Diameter (inches):	Turbidity Meter: (S/N):	Static Depth to Water (feet)
Tubing Material: PTFE (Teflon)	Water Level Indicator: (S/N):	Tubing Depth (Begin/End)
PIFE (TellOII)		
	otal Well Depth - Static Depth to Water) X Well Capacity	Volume to be Purged (gallons):
= ( feet -	feet) X gallons/foot = gallons	
Purge Method: Traditional Multipl	le Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	Total Volume Purged (gallons):
Total	Specific	

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Specific Conductance rhs/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
116		7	29.3	16.68	1.734	177	5.47	108.5	Max	puran
1128	·	1	29.3	16.62	1,907	4	5,43	107.3	21,2	brown
1138			29.31	16.60	1.977	35	5.4	107.1	7.95	
1145		Ţ	2940	16.57	2.021	. 3	5.46_	112.2	6,78	Yellowish
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Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU

#### FIELD SCREENING SUMMARY

Field Filtered: Yes/ No) Filter Size:	Duplicate: Yes/No		Time:	MS/MSD: Yes/No
PHOTO LOG: (Photo number, time/date, dir	ection photo is facing,	description of photog	graphed subject)	<u> </u>
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				·
General Notes: (Well observations/ conditions)	ns, reason if deviation	from SAP/ Protocol	) .	
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	•			
Field Screening Results: (Hach Ferrous Iro	on)			
0:00			•	
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SAMPLER(S) SIGNATURE:



SAMPLER(S) SIGNATURE:

#### **GROUNDWATER SAMPLING LOG**

SITE NAME: Smokey Mountain Smelter Site	SITE LOCATION: Knoxville, Tennessee	DATE: 6/24/14				
OTTE TARIET OFFICE STORY HOURIGIT OFFI						
WELL NO:	SAMPLE ID: MWOZA	SAMPLE TIME: 1535				
WEATHER CONDITIONS/ GENERAL OBSERVATIONS:						

	PURGING DATA	<b>V</b>
Well Type:	Pump: (S/N): SAME AS PAGE 1	Total Well Depth (feet):
Well Diameter (inches):	Water Quality Meter: (S/N):	Screen Interval (feet)
Tubing Diameter (inches): 3/16ID x 0.25OD	Turbidity Meter: (S/N):	Static Depth to Water (feet)
Tubing Material: PTFE (Teflon)	Water Level Indicator: (S/N):	Tubing Depth (Begin/End)
1 WELL VOLUME PURGE = (To	feet) X gallons/foot = gallons	Volume to be Purged (gallons):
Purge Method: Traditional Multiple	Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")	Total Volume Purged (gallons):

Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp.	Specific Conductance (ms/em or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation
746	0.50	0,50	15.87	17.23	16:13	0:69	8.96	-220,9	OVER	black
1452	1,50	1.50	15.87	17.29	10.25	048	3.94	-236.4	175	jery
1200	1.25	275	15.87	17.19	10,32	D. 29	8.76	-2367	63.5	Houdy
1512	1.50	4.25	15.87	17.11	10/35	0.20	8.92	-255 <u>,</u> 5	26.7	cloudy
1525	0.75	5,000	15.87	17.16	16.36	0.17	8.82	-26215	174	clear
528	1.50	6.50	15.87	17.21	16.36	0.14	8 80	-265.5	6.98	clear
1531	0.50	<b>7.</b> 0	15.87	1723		0.14	8.65	-2767	6,24	(1
1533	6.50	7.5	15.87	17115	10.38	0.13	8.45	-269.Z	5.73	<b>)</b> }
		, , <u> </u>	_							
				, 						
. <u></u>				<u> </u>	<u> </u>		<u> </u>			
										L
				·						·
					1					
						1				

Well Capacity (Gal/Ft): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 Stabilization Criteria Range: Specific Conductance: ± 5%; Dissolved Oxygen: ± 0.2 mg/L or 10% saturation, pH: ± 0.1 unit; Turbidity: <10 NTU

# Field Filtered: Yes No Filter Size: Duplicate: Yes No Duplicate ID: SMS NUT O Time: 1345 MS/MSD: Yes/No PHOTO LOG: (Photo number, time/date, direction photo is facing, description of photographed subject) General Notes: (Well observations/ conditions, reason if deviation from SAP/ Protocol) Purge farted black then cleared ord Field Screening Results: (Hach Ferrous Iron) O.O. MWOZA MW907A

	NTAL   FACILITIES   I	OGISTICS	G	ROUND	WATER	SAMP	LING LO	<u> </u>					
SITE NAM	E: Smokey	Mountain S	melter Site	SITE LOCA	ATION: Knox	ville, Tennes	see		DATE: 0	e125/2014			
NELL NO	SMS.	MULL	4	SAMPLE I	. 8hs	MWI	9		SAMPLE TII	ME: 1212			
EATHER	CONDITIO	NS/ GENER	AL OBSERVA	TIONS:	Class	14.	alciz	7 1ir					
			T- 1 1200		PURGING				$\mathcal{O}_{-}$				
Vell Type:	Flust	<u> </u>	Pump: (S/N)	62101	7,506	inessib	10		Total Well Do				
Vell Diam	eter (inches)	:	Water Qualit	y Meter: (S/N)	);	273	ell ins	Marth.	Screen Inter	val (feet)			
-	meter (inche	es):	Turbidity Me	ter: (S/N):	+0244	;	en) (ii	THUY	Static Depth	to Water (feet)			
<b>3/16ID x 0</b> . Tubing Ma			Water Level					11 COO	34. OK Tubing Depth (Begin/End)				
TFE (Tef	lon)	•	}		#90380	77, Sol	not						
WELL V	OLUMÉ PUI	RGE = (Tot	al Well Depth	- Static Dept	h to Water) X	Well Capacit	<del>y</del>		Volume to be	Purged (gallons):			
e ( 40 Purge Mei			feet) X		n the Top") or i	ッ 80.3	gallons 240 hing in Mid S	Gal	Total Volume	Purged (gallons):			
		Total	<del>,</del>	( Cipping non	Specific	Dissolved							
Time	Volume Purged (gal	Volume Purged (gal)	Depth to Water (feet)	Temp. (°C)	Conductance insich or μS/cm	Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation			
<del>) } 60</del>	10_	1.0	35.6	17.87	4133	0.32	6.25	1456	477	PLOMV			
150	/·O	4.0	35.58	19.25	46.00	6.2	4.28	<i>35.</i> 2€	77.6				
717	7.50	3.5	35.53	19.42	45.89	1.84	6.30	63.3	24.8 10.8	clear			
C(2)	.50 .50	3.5	25.56	19.23	45.89	11	6.30	85.2	10.0	brown			
01	50	4.0	35,41	18.123	45.35	44	10.34	260.1	4++	DIOUX			
20	1.00	5.0	35.55	19.36	46.08	·les		253.0		cleased			
238	4.00	7.0	35.56	1814	Molole	delo	6.37	199.2	10.5	CRO			
					}				*	Cled			
			<del> </del>			<u> </u>	-						
		<u> </u>				<del></del>			<del></del>				
	<del> </del>		<del> </del>						<del></del> -				
			<u> </u>			·		<del> </del>		-			
	· · ·		 	<u> </u>		ļ ————							
		<del></del>	<del></del>							<del> </del>			
	(0-1/5-1)	0.75" 0.00	111 - 0.04)	1.75" - 0.00:	2" = 0.16; 3" =	0.07: 411-	0.65; <b>5"</b> =	1.00. 6" -	1.47; <b>12</b> " = 5.88	<u></u>			
ubing insid	ty (Gai/Ft): le Diameter C Criteria Rand	apacity (Gal/F	t): 1/8" = 0.000	06; <b>3/16"</b> = 0.0	014; 1/4" = 0.0 1 Oxygen: <u>+</u> 0.2 r	026; <b>5/16</b> " = 0	0.004; $3/8" = 0$	0.006; <b>1/2</b> " =	0.010; 5/8" = 0 Turbidity: <10 /	.016			
				FIELD	SCREENING	3 SUMMAR	Y		<del></del> -				
iold Filter	ed: Yes No	Filter Siz	e. Dunli	cate: Ves/No	Duplicate	ID:	Time		MS/MSD:	Vac (NR)			
HOTO LC	G: (Photo n	umber, time/	date, direction	photo is facing	g, description of	f photograph		·	T MONIOE.				
-			***						,				
nnevel bi	atae: Atlan	haonistians (	conditions	pop if doulet	on from SAP/ f	Protocol)	<u> </u>						
eneral No	ores: (AA61) C	ipservations/	conditions, rea	ison it deviati	on nom SAP/ F	-10(0001)							
ield Scree	ening Resul	ts: (Hach Fe	rrous Iron)										
ield Scre	ening Resul	ts: (Hach Fe	rrous Iron)										



VISION   ENVIRONME	ISIONAL ENVIRONMENTAL   FACILITIES   LOGISTICS GROUNDWATER SAMPLING LOG											
SITE NAM	E: Smokey	Mountain Sr	nelter Site	SITE LOCA	ATION: Knox	ville, Tennes	see		DATE:	25/2014		
WELL NO	MW	03 B		SAMPLE	- MWO	38				NE: 1545		
			AL OBSERVA		mark	, host						
<u>,                                     </u>					PURGING I	DATA				·		
Well Type: Well Diame	HUSL ater (inches)	•	Pump: (S/N) Water Qualit	: y Meter: (S/Ñ	) 5a	nl C	ds versa	٠.5	Total Well D	. ( <i>o</i>		
Well Diameter (inches):  Tubing Diameter (inches):  Tubing Diameter (inches):  Tubing Material:  PTFE (Tefion)  Water Quality Meter: (S/N):  Con previous  Screen Interval (feet)  Screen Interval (feet)  Screen Interval (feet)  Static Depth, to Water (feet)  34												
1 WELL VO	OLUME PUR feet	-34.69	feet) X	الو gailo	h to Water) X	5.08	3 =gallons			e Purged (gallons):		
Purge Met	hod: Traditie	onal Multiple	Volume Purge	("Sipping fron	n the Top") or L	ow-Flow ("Tu	ubing in Mid S	creen")	TOTAL VOIGHT			
Time	Volume Purged (gal	Total Volume Purged (gal)	Depth to Water (feet)	Temp.	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation		
15,15	<del></del>	6.0	48.10	19.39	103.6	.70	5.59	51.1	35.1	cred 56		
1003	_ <u>;</u> S_	6.5	48.12	19.47	102.8	12	2.60	<u> </u>	18.60	clear		
1540	<del></del>	7.0	4).12	19.65	104.7	.70	5.54	7)4.7	12.0	Cherr		
1540	. 72	0.5	40.14	1071	104.4	.0-)	3.74	-t/A	<u>, , , , , , , , , , , , , , , , , , , </u>	E100		
	<del></del>	·			. ,				<del></del>			
	<del></del>			·	' 							
·	-			<del></del>		<del></del>						
	<del></del>					<u> </u>		<del></del>				
<del>-</del> - -				<u> </u>	<del></del>	<u> </u>	<del>   </del>					
	<del>  </del>		<del></del>			<u>'                                    </u>						
			<del></del>				<del></del>					
			_ <del></del>									
Well Capacity Tubing Inside Stabilization	y (Gal/Ft): e Diameter Ca Criteria Rang	0.75" = 0.02; apacity (Gal/Ft e: Specific Co	1" = 0.04; 1 ): 1/8" = 0.000 onductance: ± 5	%; Dissolved	2" = 0.16; 3" = 014; 1/4" = 0.00   Oxygen: ± 0.2 n	ng/L or 10% sat	turation, <b>pH</b> : <u>+</u>	.02; <b>6</b> " = .006; <b>1/2</b> " = -0.1 unit;	1.47; <b>12"</b> = 5.8 0.010; <b>5/8"</b> = 0 Turbidity: <10 i	8 1.016 NTU		
Field Free	<u> </u>	)							1,			
Field Filtere	a: Yes/No) G: (Phote n	Filter Size umber, time/o	e: [Duplice late, direction p	ate: Yes/No photo is facing	Duplicate description o	iD: f photograph	Time: ed subject)		MS/MSD:	Yes/No		
	<b></b>		.·			<u>.</u>		· · ·	· 			
General No	tes: (Well o	bservations/ (	conditions, rea	son if deviation	on from SAP/ F	Protocol)						
Field Scree	ning Resul	ts: (Hach Fer	rous Iron)		<del></del>	<del></del>						
			19	me!	<b>9</b>							
CAMP ED	0.000	UD=				· 						
SAMPLER(	a) SIGNATI	UHE	<u> </u>	1 1	() =	<u></u> -						



ISSOCIATES, I	GROUNDWATER SAMPLING LOG											
SITE NAM	IE: Smokey	Mountain Sr	nelter Site	SITE LOCA	TION: Knox	ville, Tennes	see		DATE: OC	4261204		
WELL NO	. Mw	14A		SAMPLE ID	SMS1	1044	9		SAMPLE TIN	ME: 09 09-		
		NS/ GENER	AL OBSERVAT	TIONS:								
· · ·			·	<del></del>	PURGING I							
Well Type	71781 ~	_	Pump: (S/N):		7 5	emo	Q)	'	Total Well De	epth (feet):		
Well Diam	eter (finches)	:	Water Quality	/ Meter: (S/N)		On	OMP N	ا مرج	Screen Interv	ar (feet)		
	meter (inche	es):	Turbidity Met	er: (S/N):	7	V		2002	Static Depth	to Water (feet)		
Well Type: Well Diameter (Inches):  Tubing Diameter (inches):  Tubing Diameter (inches):  Tubing Material:  Water Level Indicator: (S/N):  Total Well Depth (feet):  Screen Interval (feet)  Screen Interval (feet)  Static Depth to Water (feet)  Tubing Depth (Begin/End)												
PTFE (Teflon)												
1 WELL V		RGE = (Total	al Well Depth feet) X		h to Water) X ns/foot ≈	Well Capacit	y gallons		Volume to be	Purged (gallons):		
•			Volume Purge	· ·		ow-Flow ("Tu		Screen")	Total Volume	Purged (gallons):		
	Volume	Total	Depth to		Specific	Dissolved	рН					
Time	Purged (gal	Volume Purged (gal)	Water (feet)	Temp. (°C)	Conductance ms/cm <u>or</u> µS/cm	Oxygen (mg/L)	(standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation		
X34		1.0	<u>Z</u> 9. <u>5</u> 5	18:31	54.33	+ <i>F</i> ₁	(e.93	<i>a</i> ). L	78.0	clear		
N8/10	5_	1.5	39 600	1876	25.01	.57	8.19	774.1	551	clear		
76881 -	<u> </u>	20	57.50	1333 T	36.70	る。	TUR	1++4 201 5	50.4	CACK		
1903	25	2 6 X	39.50	175	NO-38	23	6.70	n. 4	39	Mari		
				<i></i>				<del>                                    </del>				
				<u> </u>								
· [	\ <del></del>				<u> </u>		<del></del> -					
	<del></del> -			<del>-</del>			<u>-</u>	<u> </u>		-,-		
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L			<u> </u>				! 	·				
		<del></del> -							<del></del>			
							<del> </del>					
<u> </u>												
Well Capaci Tubing Insid Stabilization	de Diameter C	apacity (Gal/Fi	1" = 0.04; 1 t): 1/8" = 0.000 onductance: ± 5	6; 3/16" = 0.0	014; $1/4$ " = $0.06$	026; <b>5/16</b> " = 0	0.004; <b>3/8</b> " = 0	3.006; 1/2" =	.47; <b>12"</b> = 5.88 0.010; <b>5/8"</b> = 0.4 <b>Turbidity</b> : <10 N	016		
<del></del>	<del></del>		,	FÌELD	SCREENING	SUMMAR	Υ			<del></del>		
Field Filters	ed: Yes/No	Filter Size	a. Dunlic	ate: Yes/No	Duplicate	ID:	Time:		MS/MSD.	Yes/ No		
			date, direction	photo is facing	g, description of	f photograph		·	I MOMOD.	100/110		
		•								·		
General N	otes: (Well o	bservations/	conditions, rea	son if deviati	on from SAP/ F	Protocol)						
										5		
Field Scre	ening Resul	its: (Hach Fe	rrous Iron)									
									·			
SAMPLER	(S) SIGNAT	URE:								<del></del> -		

Page 6 of 8

# SMOKEY MOUNTAIN SMELTERS KNOXVILLE, TENNESSEE

# June 2014 RI/FS Quarterly Groundwater Sampling Event

**Soil Vapor Sampling Log** 



J.M.WALLER' ASSOCIATES, INC. HANAGING THE VISION*   ENVIRONMENTAL   FACILITIES   LOGISTICS	SOIL VAPOR SAMPLING LOG	
SITE NAME: Smokey Mountain Smelters	SITE LOCATION: Knoxville, Tennessee	DATE: 6/25/14
LOCATION NO: 5MS SV 14	SAMPLE ID: 5M5 5 V1 Y	SAMPLE TIME:
WEATHER CONDITIONS/ GENERAL OBSERVA	ATIONS:	
	PURGING DATA	Sample
Hole Diameter (inches): > 1,5 ' Pum	p Type:	Purge Start: 0755

Tubing Diameter (inches): 3/16 Organic Vapor Meter: Flow-Rate Purge Complete: 6 0 Tubing Material: Organic Vapor Reading: FEV LINED VOLUME PURGE = ID of Rod X Capacity Multiplier X Feet of Rod X 0.134 Gal/CF Total Volume Purged (gallons):

Well Capacity (Gal/Ft): CMT = 0.0106, 0.75° = 0.02; 1° = 0.04; 1.25° = 0.06; 2° = 0.16 Tubing Inside Diameter Capacity (Gal/Ft): 1/8° = 0.0006; 3/16° = 0.0014; 1/4° = 0.0026; 2; **6"** = 1.47; **12"** = 5.86 **1/2"** = 0.010; **5/8"** = 0.016 **12"** = 5.88 2" = 0.16; **3"** = 0.37; 4" = 0.655" = 1.02; 5/16" = 0.004 3/8" = 0.006;

#### **SAMPLING SUMMARY**

	Duplicate: Yes/ Duplicate ID:	No		Time:	MS/MSD: Yes/ No	
Sample Analysis	Number of Type of Container		Canister ID	Preservation	Holding Time	
Summa Canister	1,	10	Fill to Gapacity	None	7 days	
Notes LEAL TEST	1700 1	PM HE IN	SHROLD,	OPPM HE IN	SV LINE	
SUMMA +0- S	er, AL	# 1514	FLOW CONT	4 +0593 6/25	CEAK TEST	
	1.:	1425		69906 5% HE		
OAUDI ED (O) OLOMATIUS.		7/1/		OPPM	IN TUBING	

SAMPLER(S) SIGNATURE

#### SOIL VAPOR SAMPLING LOG

SITE NAME: Smokey Mountain Smelters SITE LOCATION: Knoxville, Tennessee 5m55V 10-20 LOCATION NO:

WEATHER CONDITIONS/ GENERAL OBSERVATIONS:

#### SAMPLE STORT **PURGING DATA**

Hole Diameter (inches): Tubing Diameter (inches): 1/4 "D Organic Vapor Meter: P.O MINIRAG 021925 Organic Vapor Reading:

Flow Rate: 760 cc
Purge Complete: 1700-2MHz

VOLUME PURGE = ID of Rod X Capacity Multiplier X Feet of Rod X 0.134 Gal/CF

Pump Type:

Total Volume Purged (gallons):

CMT = 0.0106, 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; **3"** = 0.37; **5**" = 1.02; Tubing Inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 5/16" = 0.004;3/8" = 0.006;1/4" = 0.0026;

#### SAMPLING SUMMARY

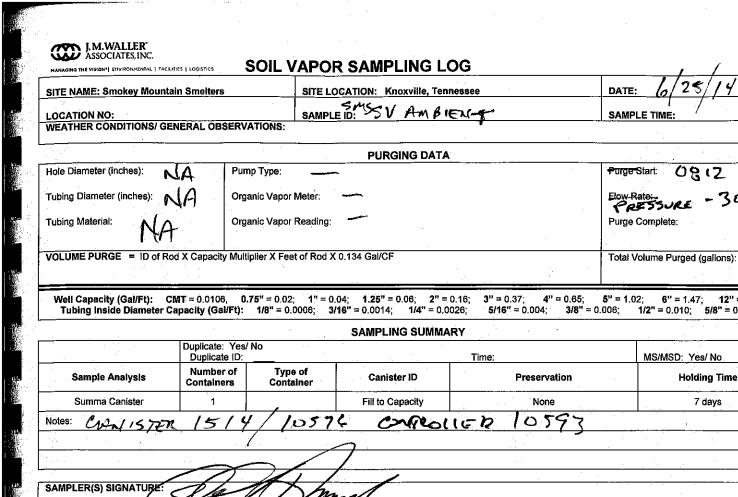
	Duplicate: Yes N Duplicate ID:	9)		Time:	MS/MSD: Yes/ No
Sample Analysis	Number of Containers	Type of Container	Canister ID	Preservation	Holding Time
Summa Canister	1	16 Suma	Fill to Capacity	None	7 days
Notes:	TEST 4.5%	, in Stree	OPPM	IN SU LINE	
			7		

SAMPLER(S) SIGNATURE:



E NAME: Smokey Mountain Smel	ters	SITE LOC	ATION: Knoxville, Tennes	ssee	DATE:	6/25/14
			S			
CATION NO: ATHER CONDITIONS/ GENERAL	OBSERVATIO	SAMPLE ONS:	10: 11/15 J V 1		SAMP	LE TIME:
		· · ·	<del></del>	<del></del>	<u> </u>	<del></del>
Discussion (trade a) N. S.		·	PURGING DATA		D	0
e Diameter (inches):	Pump Ty	/pe:			-Purge-	- 0.4
ing Diameter (inches): 3/16	Organic \	Vapor Meter:		•	Flower	H PRESSURE
ing Material:	Organic \	Vapor Reading:				Complete: ( 10
ING MATERIAL FOR LINED	)   · · ·					( 4 ( 0
UME PURGE = ID of Rod X Cap	acity Multiplier	X Feet of Rod X 0	1.134 Gal/CF		Total V	olume Purged (gallons):
			•			
/eil Capacity (Gal/Ft): CMT = 0.0	106 0 75"	= 0.02; 1" = 0.0	4; <b>1.25</b> " = 0.06; <b>2</b> " = 0.1	16; 3" = 0.37; 4" = 0.65;	<b>5" =</b> 1.0	2; <b>6" = 1.47</b> ; <b>12" =</b> 5
Tubing Inside Diameter Capacity		3" = 0.0006; 3/1			0.006;	<b>1/2"</b> = 0.010; <b>5/8"</b> = 0.01
			SAMPLING SUMMARY	<u> </u>		
Duplic	ate: Yes/No	CAN 12	308/10509 FI	EED 01-11403 COM		Market W. A.
N	icate ID:	Type of	<del></del>	Time:		MS/MSD: Yes/(No
		Container	Canister ID	Preservation		Holding Time
Summa Canister	1	:	-Fill-to-Capacity	None		7 days
<u> </u>	7469/	69723	1 4 098	68		<b>X</b>
577475764	7469/	69723		68		, ,
97,47,5,64	7469/	69723		68	•	
97,47,5,64	7469/		Row # 098			<b>&gt;</b>
97737576	7469/					
IPLER(S) SIGNATURE:		SOIL	APOR SAMPLII	NG LOG	DATE:	6/25/14
IPLER(S) SIGNATURE:  NAME: Smokey Mountain Smel		SOIL	/APOR SAMPLII	NG LOG		6/25/14 LE TIME:
IPLER(S) SIGNATURE:  NAME: Smokey Mountain Smell ATION NO:	ters	SOIL \ SITE LOC SAMPLE	/APOR SAMPLII	NG LOG		
PLER(S) SIGNATURE:  NAME: Smokey Mountain Smell  ATHER CONDITIONS/ GENERAL	ters	SOIL \ SITE LOC SAMPLE	APOR SAMPLII	NG LOG		
E NAME: Smokey Mountain Smet	iters	SOIL \ SITE LOC SAMPLE ONS:	/APOR SAMPLII	NG LOG	SAMP	LE TIME:
IPLER(S) SIGNATURE:  NAME: Smokey Mountain Smell ATION NO: ATHER CONDITIONS/ GENERAL  Diameter (inches):	DBSERVATION Pump Tyl	SOIL \ SITE LOC SAMPLE ONS:	APOR SAMPLII  ATION: Knoxville, Tennes  ID: SM S S V VS  PURGING DATA	NG LOG	SAMPI -Purge	LE TIME:
E NAME: Smokey Mountain Smell EATION NO: ATHER CONDITIONS/ GENERAL Diameter (inches):  On Diameter (inches): 3/16	DBSERVATION Pump Tyl	SOIL \ SITE LOC SAMPLE ONS:	APOR SAMPLII	NG LOG	SAMPI Purge	Start: OB (
IPLER(S) SIGNATURE:  NAME: Smokey Mountain Smell ATION NO: ATHER CONDITIONS/ GENERAL  Diameter (inches):  NAME: Smokey Mountain Smell  Diameter (inches): 7/16	Pump Tyl Organic \	SOIL \ SITE LOC SAMPLE ONS:	APOR SAMPLII  CATION: Knoxville, Tennes  D: SM 5 5 V 15  PURGING DATA  O MINIRAE	NG LOG	SAMP  Purge  Flow R	Start: OBIO ate:
IPLER(S) SIGNATURE:  E NAME: Smokey Mountain Smell CATION NO:	Pump Tyl Organic \	SOIL \ SITE LOC SAMPLE ONS:  Vapor Meter:	APOR SAMPLII  ATION: Knoxville, Tennes  ID: SM S S V VS  PURGING DATA	NG LOG	SAMP  Purge  Flow R	Start: OBIO
E NAME: Smokey Mountain Smell EATION NO: ATHER CONDITIONS/ GENERAL Diameter (inches):  On Diameter (inches): 3/16	Pump Tyl Organic \	SOIL \ SITE LOC SAMPLE ONS:  Vapor Meter: ( Vapor Reading:	APOR SAMPLII  CATION: Knoxville, Tennes  D. PURGING DATA  O. I PPM  O. I PPM	NG LOG	Purge	Start: OBIO ate:
E NAME: Smokey Mountain Smell EATION NO: ATHER CONDITIONS/ GENERAL Diameter (inches):  Ing Diameter (inches): 3/16  Ing Material:	Pump Tyl Organic \	SOIL \ SITE LOC SAMPLE ONS:  Vapor Meter: ( Vapor Reading:	APOR SAMPLII  CATION: Knoxville, Tennes  D. PURGING DATA  O. I PPM  O. I PPM	NG LOG	Purge	Start: 0810 ate:- Complete: 28.5"H
IPLER(S) SIGNATURE:  NAME: Smokey Mountain Smell ATION NO: ATHER CONDITIONS/ GENERAL  Diameter (inches):  NAME: Smokey Mountain Smell  Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inches):  One Diameter (inche	Pump Tyl Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic \ Organic	SOIL \ SITE LOC SAMPLE  Vapor Meter: Vapor Reading:  X Feet of Rod X 0	PURGING DATA  O J PP M  134 Gal/CF	NG LOG    16	SAMPI  Purge  Flow R  Ant T  Purge of Total V	Start: OB (O) ate: Complete: 28.5 H

· ·		<u> </u>	SAMPLING SUMMARY	· · · · · · · · · · · · · · · · · · ·	
	Duplicate: Yes Duplicate ID:	¥0)		Time:	MS/MSD: Yes/No
Sample Analysis	Number of Containers	Type of Container	Canister ID	Preservation	Holding Time
Summa Canister	1		Fill to Capacity	None	7 days
Notes: CAN 12	270/09	169 Co	MANUER 10861		
		)			
SAMPLER(S) SIGNATURE			Smal	<u> </u>	



SOIL VAPOR SAMPLING LOG

SITE NAME: Smokey Mountain, Smelters

SITE LOCATION: Knoxville, Tennessee

LOCATION NO:

SAMPLE ID: 5M55 D 38 - 15

WEATHER CONDITIONS/ GENERAL OBSERVATIONS:

WEATHER CONDITIONS/ GENERAL OBSERVATIONS:

PURGING DATA

Hole Diameter (inches): Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump Type: Pump

Well Capacity (Gal/Ft): CMT = 0.0106, 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

Tubing Inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.016

SAMPLING SUMMARY Duplicate: Yes//No MS/MSD: Yes/No Duplicate ID: Time: Number of Type of Canister ID 179 /10499 **Holding Time** Sample Analysis Preservation Containers Fill to Capacity Summa Canister 7 days Notes: SMROJO

AN ATENO WAS MADE TO COURT GROUND WATER OF SUB. DOT TO 41. HOLE
SAMPLER(S) SIGNATURE:

WAS DRY.

Page 4 of 8

J.M.WALLER ASSOCIATES, INC. SOIL VAPOR SAMPLING LOG MANAGING THE VISION® ENVIRONMENTAL | FACILITIES | LOGISTICS SITE LOCATION: Knoxville, Tennessee SITE NAME: Smokey Mountain Smelters 5m < 5113 LOCATION NO: SAMPLE TIME SAMPLE ID: WEATHER CONDITIONS/ GENERAL OBSERVATIONS: **PURGING DATA** 1240 -Purge Start: Hole Diameter (inches): Pump Type: Flow-Rate: - 28.5 " # Tubing Diameter (inches). Organic Vapor Meter: Purge Complete: 125 Tubing Material: Organic Vapor Reading: . DPPM VOLUME PURGE = ID of Rod X Capacity Multiplier X Feet of Rod X 0.134 Gal/CF Total Volume Purged (gallons) **1.25"** = 0.06; Well Capacity (Gal/Ft): CMT = 0.0106, 0.75'' = 0.02;1" = 0.04; 2" = 0.163" = 0.37; 4" = 0.65;6" = 1.47; 12" = 5.88 1/4" = 0.0026; Tubing Inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/2" = 0.010; 5/8" = 0.016 5/16" = 0.004; 3/8" = 0.006;SAMPLING SUMMARY Duplicate: Yes/No Duplicate ID: MS/MSD: Yes/ No. Time: Number of Type of Container Sample Analysis Preservation **Holding Time** Containers Summa Canister 7 days LEAK Notes: PP IN IN TUBING SAMPLER(S) SIGNATURE: SOIL VAPOR SAMPLING LOG SITE LOCATION: Knoxville, Tennessee SITE NAME: Smokey Mountain Smelters SAMPLE ID: 5M5 5V11 -11 LOCATION NO: SAMPLE TIME: WEATHER CONDITIONS/ GENERAL OBSERVATIONS: **PURGING DATA** Hole Diameter (inches): Pump Type: Purge Start: Tubing Diameter (inches): Organic Vapor Meter: Flow Rate: Tubing Material: Organic Vapor Reading: JPPM VOLUME PURGE = ID of Rod X Capacity Multiplier X Feet of Rod X 0.134 Gal/CF Well Capacity (Gal/Ft): CMT = 0.0106, **0.75"** = 0.02; **1"** = 0.04; 1.25" = 0.06;2" = 0.16 3" = 0.37;4" = 0.65; **5"** = 1.02: **6"** = 1.47 Tubing Inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004;  $3/8^{*i} = 0.006;$ 1/2" = 0.010; 5/8" = 0.016 **SAMPLING SUMMARY** Duplicate: Yesi/No Duplicate ID: MS/MSD: Yes/ No Number of Type of Sample Analysis Preservation **Holding Time** Containers Container Summa Canister 7 days M77200 D Notes: OPPM

SAMPLER(S) SIGNATURE:

SAMPLING SUMMARY Duplicate: Yes/No MS/MSD: Yes/ No Duplicate ID Time: Number of Type of Canister ID

SIG L-A71

Pilito Capacity Sample Analysis Preservation **Holding Time** Containers Container GESEN. Summa Canister 7 days Notes: SHROUD ~ 500 PPM 7086 SAMPLER(S) SIGNATURE:

J.M.WALLER ASSOCIATES, INC. HANAGING THE VISION*) ENVIRONMENTAL (FACILITY		SOIL V	VAPOR SAMP	LINGLOG						
SITE NAME: Smokey Mountai	<del></del>	7	ATION: Knoxville, Tenn		DATE:	6/25/19				
LOCATION NO:		SAMPLE ID	159							
WEATHER CONDITIONS/ GEN	NERAL OBSERVATIONS:	SAIMPLE IL	<u>. 34(3 )                                 </u>	<u> </u>	ANNE	LE TIME:				
<del></del>			PURGING DATA	<del></del>						
Hole Diameter (inches):	Pump Type:		<u> </u>	<del></del>	Purge	Start: 22				
Tubing Diameter (inches):	ANE Organic Vap	or Meter: P	D		Flow-R	ate - 28" HC				
Tubing Material:	Organic Vap	or Reading:	OPPM		Purge	Complete: 1644 - 4" HC				
VOLUME PURGE = ID of Rod X Capacity Multiplier X Feet of Rod X 0.134 Gal/CF  Total Volume Purged (gallons):  360 CC										
Well Capacity (Gal/Ft): CMT = 0.0106, 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 8" = 1.47; 12" = 5.88  Tubing inside Diameter Capacity (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016										
			SAMPLING SUMMAI	RY.		-5" H3				
	Duplicate: Yes/No 5	455V	3 D-11	Time:	5184	MS/MSD: Yes/No				
Sample Analysis	Number of Ty	pe of tainer	Canister/ID	Preservation	,	Holding Time				
Summa Canister	1		Fill to Capacity	None		7 days				
Notes: LEGK TEST: 7800 PGM VAVER SHROW, O.PPMIN TUBIAL										
		<u> </u>	<del></del>	<del></del>	<del></del> .					
			<del>/</del>	<del></del>						
SAMPLER(S) SIGNATURE:	Kell 1	Shu								
						· · · · · · · · · · · · · · · · · · ·				
	·	SOIL V	APOR SAMPL	ING LOG	·					
SITE NAME: Smokey Mountain	n Smelters	SITE LOCA	TION: Knoxville, Tenn	essee	DATE:					
LOCATION NO: WEATHER CONDITIONS/ GEN	IERAL OBSERVATIONS:	SAMPLE ID	<b>)</b> :	·	SAMP	LE TIME:				
			PURGING DATA	<del></del>						
Hole Diameter (inches):	Pump Type:	<del></del>			Purge	Start:				
Tubing Diameter (inches):	Organic Vapo	r Meter:			Flow R	ate:				
Tubing Material:	Organic Vapo	r Reading:			Purge	Complete:				
VOLUME PURGE = ID of Roo	X Capacity Multiplier X Fo	et of Rod X 0.1	34 Gal/CF	<del></del>	Total V	olume Purged (gallons):				
Well Capacity (Gal/Ft): CN Tubing Inside Diameter Ca		2; 1" = 0.04; 0.0006; 3/16"	1.25" = 0.06; 2" = 0 ' = 0.0014; 1/4" = 0.00		<b>5" =</b> 1.0: 0.006;	2; <b>6"</b> = 1.47; <b>12"</b> = 5.88 <b>1/2"</b> = 0.010; <b>5/8"</b> = 0.016				
			SAMPLING SUMMAR	RY						
	Duplicate: Yes/ No Duplicate ID:			Time:		MS/MSD: Yes/ No				
Sample Analysis		ne of tainer	Canister ID	Preservation		Holding Time				
Summa Canister	1	- 4v.	Fill to Capacity	None		7 days				
Notes:			<del></del>	<del></del>	<u>.</u>					

SAMPLER(S) SIGNATURE:



VISION* ENVIRONME	NTAL   PACILITIES   14	00ISTICS	SION'S ENVIRONMENTAL I PACILITIES   LOGISTICS GROUNDWATER SAMPLING LOG											
SITE NAM	E: Smokey	Mountain Sn	neiter Site	SITE LOCA	TION: Knox	ville, Tennes	see		DATE: 6	24/14				
WELL NO	:			SAMPLE ID	SMSS	VGW.	13		SAMPLE TIM	E: 1310				
		NS/ GENER	AL OBSERVA					/						
7	PURGING DATA													
Well Type:	DPT		Pump: (S/N):					_	Total Well De	pth (feet):				
l .	eter (inches):		Water Quality	y Meter: (S/N)	y51 3	556 MP	5 02	4619	Screen Interv	al (feet)				
Tubing Dia	meter (inche	200	Turbidity Met		tack	•			Static Depth t	o Water (feet)				
3/46ID x 0.2550 X # 1 D Tubing Material:  Water Level Indicator: (S/N):  Tubing Depth (Begin/End)  PTFE (Teflon)														
1 WELL VOLUME PURGE = (Total Well Depth - Static Depth to Water) X Well Capacity Volume to be Purged (gallons):  = ( feet - feet) X gallons/foot = gallons														
= ( feet — feet) X gallons/root = gallons   Total Volume Purged (gallons):   Purge Method: Traditional Multiple Volume Purge ("Sipping from the Top") or Low-Flow ("Tubing in Mid Screen")														
Time	Volume Purged (gal	Total Volume Purged	Depth to Water (feet)	Temp. (°C)	Specific Conductance ms/cm <u>or</u>	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTUs)	Odor/ Color Observation				
1208	0.25	(gal) 0.25	(1001)	20.49	μS/cm 2.5/2.7	0.50	7 12	-7-7	7/000					
12-19	0.75	1.0		18.86	2.453	112	6.85	1116	7/000					
1275	1.0	2.0	-	17.79	2449	1.12	6.92	1109	2/000	·				
1247	0.5	2.5	-	18.01	2445	1.14	6.95	1154	599					
125B	0.5	3.5		17.64	2.436	1,08	6.87	116.1	946					
1305	0.8	3.5		17.21	2429	1.21	6.90	116.3	585	·				
<u> </u>	· 		·		ļ	-								
				<del>, , , , , , , , , , , , , , , , , , , </del>		·		·		·				
<u> </u>	<u> </u>			·	<del> </del>	<u> </u>								
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	<del> </del>			-										
									- 1					
	<u> </u>		· · · ·		· 	·								
							<u></u>			<u></u>				
Well Capac Tubing Insid Stabilization	de Diameter C	apacity (Gal/Fi	): 1/8" = 0.000	06: <b>3/16</b> " = 0.0	2" = 0.16; 3" = 014; 1/4" = 0.0 I Oxygen; ± 0.2 r	026; <b>5/16</b> " = 0	0.004; <b>3/8</b> " = 0	0.006; 1/2" =	1.47; <b>12"</b> = 5.88 0.010; <b>5/8"</b> = 0.0 Turbidity: <10 N	)16				
			<del></del> -	FIELD	SCREENING	SUMMAR	Y .		<del></del>					
	ed: Yes/ No			cate: Yes/ No			Time:	:	MS/MSD:	Yes/ No				
FHOIOTC	JG. (PIIOTO N	umper, ame/o	aate, direction∤	Prioto is tacini	g, description o	n huorograph	eu subject)			. 1				
General N	otes: (Well c	bservations/	conditions, rea	son if deviati	on from SAP/ I	Protocol)			<del></del>					
									·					
Field Scre	enina Resul	ts: (Hach Fe	rrous Iron)	<del></del>			<u> </u>			<del></del>				
		· 1		١,	,									
			en 16	1 -	·	, 	·			2.1				
SAMPLER	(S) SIGNAT	URE:							<u>-</u>					

# SMOKEY MOUNTAIN SMELTERS

Knoxville, Knox County, Tennessee

June 2014

Quarterly Event 4

Remedial Investigation / Feasibility Study

Surface Water Sampling Log
Book 1 of 2



MANAGING THE VISION® | ENVIRONMENTAL | FACILITIES | LOGISTICS



MANAGING THE VISION* ENVIRONMENTAL | FACILITIES | LOGISTICS

### **INSTRUMENT AND CALIBRATION LOG**

#### Site Name:

Date	Parameter	Calibration Value	Time	Verification Response	Time	Signature	Instrument Type and Manufacturer	Serial Number	Calibration Standard Lot	POST-CAI
0/0/0	example ORP cal and verification	240 mV	803	238.7	813	Signature	Example/Example	Pine 010111	N6L77-8	
0/0/0	example pH 7 verification			6.98	1752	Signature	Example/Example	Pine 010111	M6A84-2	
'daalid	N 10_	94.	1244	1000	2:45	Cloud	YST 550	0240P9		
	Conductority	1.499	12:47	1-413	12 X	cens		1	23 078550	
	17 H 7 - 0	7.00	12:50	7.00	12:21	1			10704	778
	5ix 4.0	3.95	12:51	4,00	12:52				230A78.	4.12
	10127	2059	ふシ		12 ts			سئد	8945	2396
<b>WASIN</b>	DATA	103.1	D7130	100.0	09:32	and	YST 550	1271019		
	anductioning		0 <del>2:32</del>	1,413	67,75	<u> </u>				1.418
	DH 7.6	7.01	めぶす	760	07:35		ť.		,	7.63
	DH 4:0	293	67.40	4.00	07:43				1.	4.15
	ARR		17:45	240	974J			<u></u> 0	and V	0425
<b>BAHR</b>	DOPO	101.8	0409	1000	18811	and	YSI 556	COHOH?	,	
, – ,,	conductivity	1.42	0811	1.413	01/12	<u> </u>				1,375
	OF HO		3012	7,00	0813	, '				7.08
	0 H 4.0	299	0214F	4-00	OK/S	· ·			<b>V</b>	4.13
	PORD	1060	083100	236	GR18		\ <u>'</u>			231.3
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Each instrument will be calibrated using calibration standards provided by the manufacturer or instrument vendorat the beginning of each work day, after battery replacement during each work day, after sensor maintenance during each work day, and after a failed calibration verification. Calibration consists of stabilization and electronic "spanning" of the instrument/sensor resposne to the calibration standard set via instrument software and manufacturer's instructions. Calibration verification consists of stabilization of the instrument/sensor with the calibration standard set to verify response within +/- 10% of the calibration standard set value. Calibration verification will be performed immediately following calibration, at the end of each instrument use period (ie before turning the instrument off), at initiation of instrument use after restarting (ie after turning the instrument on after a shutdown during the work day), at any time during the work period when instrument readings are suspect, and at any time directed by the FOL. Include the unit of measure, i.e. "mV", "S.U.", "NTU", etc. in the calibration value column. THE FOL WILL REVIEW THIS CALIBRATION LOG AND COMPLETE THE FORM WITH HIS/HER SIGNATURE AT THE END OF EACH WORK DAY.

FOL Name:	FOL Signature:
	=

E VISION*) ENVIRONME	NTAL   FACILITIES   L	OGISTICS	SUR	FACE V	VATER S	SAMPLI	NG LO	G		
SITE NAM	IE: Smokev	Mountain Sm	elters	SITE LOC	ATION: Kno	xville, Tenne	ssee		DATE: ORDANY	
SAMPLE		125	11/V	-771	<u> </u>				SAMPLE TIME;	1 6
OAIMI LE				<del></del>			<del>-</del>		Over LE Trail.	} - F
Time	Temp.	Specific Conductance ms/cm or uS/cm	Dissolved Oxygen (mg/L)	pH (standar d units)	ORP (mV)	Turbidity (NTU)			Fe (capsule)	
						-			Range :	
	<u> </u>			<u> </u>				<u> </u>	Result:	Į .
Stream Flo	ow rate:		Strean	n width:		Stream de	pth:			
Field Filter	Field Filtered: Yes/ No Filter Size: Duplicate: Yes/ No Duplicate ID: Time: MS/MSD: Yes/ No									
SAMPLER(S) SIGNATURE:									ļ	
									].	
Notes: Det Could vot Sample see page 2 of le										_
SITE NAM	IE: Smokey	Mountain Sm	elters	SITE LOCA	TION: Knox	ville, Tennes	see	· <del>-</del>	DATE: 070122114	1
SAMDLE	ID: 53	1551	113	<del></del>					ا السوي و ا	
SAMPLE ID: SAMPLE TIME: 14.15										
Time	Temp. (°C)	Specific Conductan ce ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)		•	Fe (capsule)	
1415	17.44	9128	3.62	7.29	-38.7	3.90	*-		Range :	
Stream Flo	ow rate:	(O=1,5	F4K Stream	n width: 5	feef	Stream de	oth: 4in	ChOS		
1	ed: Yes/No	, T		cate: Yes No			Time		MS/MSD: Yes No	
SAMPLER	R(S) SIGNAT	URE:	7		<u> </u>			,		
,			$Q^{\lambda}$		K	_				
Notes:										_
Photo: 2014-06-22 14. 20.33, facing 500									2	
SITE NAM	IE: Smokey	Mountain Sm	elters	SITE LOCA	TION: Knox	ville, Tennes	see		DATE: 00123114	
SAMPLE	ID: 51	1581	\(\)e_1						SAMPLE TIME: 1455	
				<del>-</del>						L .
Time	Temp. (°C)	Specific Conductan ce ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)			Fe (capsule)	
1455	18.41	1.603	7.57	7.107	1604	5.78			Range :	
Stream Flo	ow rate: \	ef+15	Strean	n width: `7	feet	Stream de	oth: 1001	nolos	3	
i	red: Yes No		: Duplic	cate: Yes No			Time		MS/MSD: Yes/No	
SAMPLER	R(S) SIGNAT	URE:	7	16	*	<del></del> -				I

Notes:

PhAO: 2014-020-22 14.560.49, June 22@ 14:500 Page 1 of 6 facing North

É <u>AIRIONA</u> ÉMAIBÓNM	ENTAL   FACILITIES   (	OGISTICS	SUR	FACE V	VATER:	SAMPLI	NG LO	<u>G</u>		
SITE NAI	ME: Smokey	Mountain Si	melters	SITE LOCA	TION: Knox	ville, Tennes	see		DATE:	082/0014
SAMPLE	Ch	4584	410	·				- <del></del>	SAMPLE TI	14 - 415
	<del></del>									
Time	Temp. (°C)	Specific Conductan ce ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)			Fe	(capsule)
<i>b</i> 00	1868	:508	7.34	7.80	135.3	4.02			Range :	04
Stream FI	ow rate: +	35413	Strea	m width:	Seel	Stream de	oth: Hoc	<del>}</del>		· · · · · ·
Field Filte	red: Yes/No	Filter Siz	ze: Dupli	cate: Yes No	Duplicate	ID:	Time	<u>:</u>	MS/MSD:	Yes/No
SAMPLER(S) SIGNATURE:										
Lowes										
And SMSSWO9 to take a picture of the local formal weeks to sumpose. Photo # 2014-66-33 15,20										
4		<del></del>	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	<del>,                                    </del>		· · · · ·	rnoto	7 20	40106 -1	7166-06
SITE NAM	/E: Smokey	Mountain Sn	neiters	1	TION: Knox				DATE:	6 BON 14
SAMPLE ID: 5M8 SW095PRING SAMPLE TIME: 1645										
		Specific	Dissolved	На				-		
Time	Temp.	Conductan ce ms/cm or μS/cm	Oxygen (mg/L)	(standard units)	ORP (mV)	Turbidity (NTU)	<u> </u>		Fe	(capsule)
1645	17.87	1893	8.60	7.73	1578	33.6			Range :	3-60x
Stream Flo	ow rate:	5445	Stream	n width: 3 $\S$	4	Stream de	oth: 135	4		
Field Filter	red: Yes No	Filter Siz	e: Dupil	cate: Yes/No	Duplicate	ID:	Time	: <u>.</u>	MS/MSD:	Yes/No)
SAMPLER	R(S) SIGNAT	URE:	In	D	`	·				
Notes:	D.	1 <del>0-</del> 8	00	8	15w	<u></u>				
	Pr W	ii U	てと	- س	$\omega$	<u> </u>				•
SITE MAN	IE: Smake:	Mountain Sn	neltere	SITE LOCA	TION: Vac-	villa Tanna-			DATE: 6	23/14
<del></del>			Spring		TION: Knoxy	ville, rennes:	see			0.0-
SAMPLE	<u>ın: - ( ( -</u>		1	1	<del></del>				SAMPLE TH	WE:
Time	Temp.	Specific Conductan cerns/cm or us/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)	<del></del>		Fe	(capsule)
907	10 46		7.74	7.4	171.2	2.41			Range :	
	18.45	1.598	7.17	7 1	111.	2.1			Result: 🔊	· D
Stream Fig	ow rate:	<del></del>	Stream	n width:		Stream de	oth:		<del></del>	
Field Filter	red: Yes/No	Filter Siz	e: Dupli	cate: Yes/No	Duplicate	ID:	Time:	<u>:</u>	MS/MSD:	Yes/ No
SAMPLE	R(S) SIGNAT	URE:			<del></del>			<del></del>		

Notes:

Photo: 2014-070-23,008,43,42



SHS8W12 Photos-2014-020-23 10.20

			<u> </u>	<u> </u>	AILD .	SAMPLI	NG LU	<u> </u>	T'
SITE NAM	IE: Smokey	Mountain Sme	lters	SITE LOC	ATION: Kn	oxville, Tenn	essee		DATE: 6 23 14
SAMPLE	ID: 5M	SSWO	8						SAMPLE TIME: 7 2-7
	<u> </u>			· ·	<del>-</del>				<del></del>
Time	Temp. (°C)	Specific Conductance ins/cm_or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)			Ferrous Iron (Field Test)
922	17.65	1.683	7.29	7.54	185	3.16			Range:
Stream Flo	ow rate:	NA	Stream	width:	j R	Stream dep	oth: NF	۲	
Field Filter	red: Yes No	Filter Size:	Duplica	te: Yes/No	Duplicate	ID:	Time	ə:	MS/MSD: Yes/No
SAMPLE	R(S) SIGNAT	URE:		~·•					
Notes:	7	Photo	: 2014	t-04	?-23	08.	47.	20 D	licing N
				-		OXX	PT 11 6 7	94 .ir	Chap V
SITE NAM	E: Smokey	Mountain Sme	Iters	SITE LOC	ATION: Knd	oxville, Tenne	essee		DATE: 6 23 14
SAMPLE	ID: SM	SWOY	<u> </u>	•					SAMPLE TIME:
								•	
Time	Temp. (°C)	Specific Conductance ns/cm/or µs/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)		į	Fe (capsule)
1000	18.28	10.36	0.46	6.6	192.3	6.62			Range :
Stream Fk	ow rate:		Stream	width:		Stream dep	ith:		
Field Filter	red: Yes/No	Filter Size:	Duplica	te: Yes No	Duplicate	_{ID:} <b>S</b> MS	SN9 Time	1010	MS/MSD: Yes No
SAMPLER	R(S) SIGNAT	URE: Q		· .					
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									14 1000.00
CITE NAM	IE: Smokev I	Mountain Smel	iters 5	SITE LOCATI	ON: Knoxy	rille, Tenness			DATE: ORDRICH
SHE NAME	€.	KSIN	08-5	NSCI	-				SAMPLE TIME:
SAMPLE	ID: \ \	1 1 1 1		, ,,					
	Temp.		Dissolved Oxygen ( (mg/L)	pH standard units)	ORP (mV)	Turbidity (NTU)			Fe (capsule)
SAMPLE	Temp.	Conductan ce ms/cm	Oxygen (	standard					Range :
SAMPLE	Temp. (°C)	Conductan ce ms/cm	Oxygen (	standard			· · · · · · · · · · · · · · · · · · ·		
Time Stream Flo	Temp. (°C)	Conductan ce ms/cm	Oxygen (mg/L) (	standard units)			th:		Range :

Page 3 of 6



	y Mountain Sme	Iters	SITE LOC	ATION: Kn	oxville, Tennes	see	DATE: 00 103 10014
AMPLE ID:	MSSu	)OS .	-QX	SK -		SAMPLE TIME:	
	<del></del>		<del></del>			<del></del>	=====
Time Temp.	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)	· 	Ferrous Iron (Field Test)
	n		- 1				Range :
tream Flow rate:		Stream v	vidth:	<u></u>	Stream depth	<u>:</u>	
ield Filtered: Yes/ N	lo Filter Size:	Duplicat	e: Yes/No	Duplicate	ID:	Time:	MS/MSD: Yes/ No
AMPLER(S) SIGN	TURE:	N	5	7	<del></del>	<del>- · </del>	
lotes: D	RY		Pho	to: ô	3014-1	Do-29	13.08.42
ITE NAME: Smoke	y Mountain Smei	ters	SITE LOCA	ATION: Kno	oxville, Tennes	see	DATE: 0018-4604
AMPLE ID:	SMSSI.	210			<u>.                                      </u>		SAMPLE TIME: 0900
Time Temp.	Specific Conductanc e ms/cm <u>or</u> µS/cm	Dissolved Oxygen (mg/L)	pH (standar d units)	ORP (mV)	Turbidity (NTU)		Fe (capsule)
900268	7301	6.05	7.01	187.3	26.2		Range: Result: 710 Mal
tream Flow rate:	<u>), o</u>	Stream v	vidth: 🗷	J4.	Stream depth	281.	3
ield Filtered: Yes/	Filter Size:	Duplicat	e: Yes/	Duplicate	ID:	Time:	MS/MSD: Yes/No
AMPLER(S) SIGNA	TURE	'n	<del>(</del> )			<del></del>	
lotes:		Pho	Hrn : =	2014	-Ma-3	4 08.5	<u> </u>
		110	V.U 10	70 t 1		· T 00,3	10.00
					***		
							· ·
· ·	v Mountain Smal	ters	SITE LOCATI	ON: Knovy	rille. Tennosse		DATE: MOIDLIANK
TE NAME: Smoke	y Mountain Smel	ters s	BITE LOCATI	ON: Knoxy	ville, Tennesse	<u> </u>	DATE: 010/24/2014
ITE NAME: Smoke	y Mountain Smel	ters s	BITE LOCATI	ON: Knoxy	rille, Tennesser	<u> </u>	DATE: 010/34/30/4
ITE NAME: Smoke	Specific Conductor	20)	pH standard units)	ON: Knoxv	Turbidity (NTU)		~~
Time Temp.	Specific Conductan ce ms/cm	Dissolved Oxygen (mg/L)	pH standard units)	ORP	Turbidity		SAMPLE TIME: 09/9
TE NAME: Smoke	Specific Conductan ce ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH standard units)	ORP (mV)	Turbidity (NTU)		Fe (capsule)

Notes:

Phato: 2014-020-24 09-14-56



ASSOCIATES, INC.

HANAGING THE VISIDIN/ ENVIRONMENTAL | FACILITIES | LOGISTICS SURFACE WATER SAMPLING LOG

OIL INVIII	E: Smokey	Mountain Smo	elters	SITE LOC	ATION: Kn	oxviile, Tenr	essee	DATE: OLE 24/21
SAMPLE	d: 5//	455 W	05					SAMPLE TIME: 0940
====		0		<del></del>		<del></del>	<del></del>	
Time	Temp.	Specific Conductance ms/cm <u>or</u> µS/cm	Dissolver Oxygen (mg/L)		ORP (mV)	Turbidity (NTU)	Flow A	iate Ferrous Iron (Field Test)
0940	ata	.543	5.44	7.64	130.5	25.6		Range :
Stream Flo	w rate:	7.0	Stream	width:	PT.	Stream de	oth: 2 Fe	ef
Field Filter	ed: Yes No	Filter Size:	Duplic	ate: Yes No	) Duplicate	ID:	Time:	MS/MSD: Yes/ No
SAMPLER	(S) SIGNAT	TURE	11		·	<del></del>		
Notes:	<del></del>							
								·
		•						
· ·	·							
SITE NAM	E: Smokey	Mountain Sme	elters	SITE LOCA	TION: Kno	cville, Tenne	ssee	DATE:
SAMPLE !	D:			·				SAMPLE TIME:
	====		<del></del>	F=====				<del> </del>
Time	Temp. (°C)	Specific Conductance ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)		Fe (capsule)
			1					Range :
			<del>}</del> _	<u> </u>		<u> </u>		Result:
Stream Flo	w rate:	· · · · ·	Stream			Stream de	oth:	
	ed: Yes/No		Duplic	ate: Yes/No	Duplicate	ID:	Time:	MS/MSD: Yes/ No
SAMPLER	(S) SIGNAT	'URE:						
Notes:				<del></del>			<del></del>	
							-	
				·	<del></del>		·	· · · · · · · · · · · · · · · · · · ·
SITE NAME: Smokey Mountain Smelters SITE LOCATION: Knoxvill						ville, Tennes	see	DATE:
SITE NAM	c. Ontokey					·		SAMPLE TIME:
SITE NAM								
		Special 1						<del></del>
		Specific Conductan ce ms/cm or µS/cm	Dissolved Oxygen (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)		Fe (capsule)
SAMPLE II	D:	ce ms/cm	Oxygen	(standard				Range :
SAMPLE II	D:	ce ms/cm	Oxygen	(standard		(NTU)		
SAMPLE II	Temp.	ce ms/cm	Oxygen	(standard units)		(NTU)	oth:	Range :

Page 5 of 6

### **SMOKEY MOUNTAIN SMELTERS**

The state of

Knoxville, Knox County, Tennessee

June 2014

**Quarterly Event 4** 

Remedial Investigation / Feasibility Study

Surface Water Sampling Log
Book 2 of 2



MANAGING THE VISION® | ENVIRONMENTAL | FACILITIES | LOGISTICS



MANAGING THE VISION ! ENVIRONMENTAL | FACILITIES | LOGISTICS

#### INSTRUMENT AND CALIBRATION LOG

#### Site Name:

Date	Parameter	Calibration Value	Time	Verification Response	Time	Signature	Instrument Type and Manufacturer	Serial Number	Calibration Standard Lot
0/0/0	example ORP cal and verification	240 mV	803	238.7	813	Signature	Example/Example	Pine 010111	N6L77-8
0/0/0	example pH 7 verification		-	6.98	1752	Signature	Example/Example	Pine 010111	M6A84-2
0-22W	DN 10	10	1247	1602			YC/ R7431		
	767	7	1244	7107		1			
	ကြည်မှ	I Y	700	Yea					
	ORD	240	(157	12407					1-1
	Gund	1/413	752	1.50					
22.N	Cond	1.413	760	1.5/					
1	2h7	7,0	1967	7.08					
	1 0410	10.0	1264	16107					
	ore phy	ZW	1 <b>56</b> 6	226					
	phy	40	19/10	G.11					
		<u></u>		71					
							·		
									+
		·							

Each instrument will be calibrated using calibration standards provided by the manufacturer or instrument vendorat the beginning of each work day, after battery replacement during each work day, after sensor maintenance during each work day, and after a failed calibration verification. Calibration consists of stabilization and electronic "spanning" of the instrument/sensor resposne to the calibration standard set via instrument software and manufacturer's instructions. Calibration verification consists of stabilization of the instrument/sensor with the calibration standard set to verify response within +/- 10% of the calibration standard set value. Calibration verification will be performed immediately following calibration, at the end of each instrument use period (ie before turning the instrument off), at initiation of instrument use after restarting (ie after turning the instrument on after a shutdown during the work day), at any time during the work period when instrument readings are suspect, and at any time directed by the FOL. Include the unit of measure, i.e. "mV", "S.U.", "NTU", etc. in the calibration value column. THE FOL WILL REVIEW THIS CALIBRATION LOG AND COMPLETE THE FORM WITH HIS/HER SIGNATURE AT THE END OF EACH WORK DAY.

FOL Name:	FOL Signature:	
	• —	

*

SURFACE WATER SAMPLING LOG

MPLE ID: SWOI SMSSWOI  Ime Temp. Conductant Congregation (my) Chromitum (Must Filter)  Temp. (C) Conductant Congregation (my) Chromitum (Must Filter)  Temp. (C) Conductant Congregation (my) Chromitum (Must Filter)  Temp. (C) Conductant (my) Chromitum (Must Filter)  Time: Range:  Result: D. 61 mg/L  MS/MSD: Yes (G)  MPLE ID: SMSSWII  E NAME: Smokey Mountain Smelters  SITE LOCATION: Knoxville, Tennessee  DATE: 6 22 14  SAMPLE TIME: 15 45  DISSONED  DATE: 6 22 14  SAMPLE TIME: 15 45  DATE: 6 22 14  SAMPLE TIME: 15 45  Time: MS/MSD: Yes (G)  DATE: 6 22 14  SAMPLE TIME: 15 45  Time: MS/MSD: Yes (G)  DATE: 6 22 14  SAMPLE TIME: 15 45  Time: MS/MSD: Yes (G)  DATE: 6 22 14  SAMPLE TIME: 15 45  Time: MS/MSD: Yes (G)  DATE: 6 22 14  SAMPLE TIME: 15 45  Time: MS/MSD: Yes (G)  Range: Result: 0.0 mg/L  Chromitum (Must Filter)  Result: 0.0 mg/L  Chromitum (Must Filter)  Time: MS/MSD: Yes (G)  Range: Result: 0.0 mg/L  Chromitum (Must Filter)  Time: MS/MSD: Yes (G)  Range: Result: 0.0 mg/L  Chromitum (Must Filter)  Time: MS/MSD: Yes (G)  Duplicate: Yes (G)  Duplicate: Yes (G)  Duplicate: Yes (G)  Duplicate: Yes (G)  Duplicate: Yes (G)  DATE: DATE:
Temp. Condender (190) Dissolve (standard only (MV) (NTO) Chromium (Must Filter)  73 / 738 0.284 8.31 7.47 72.29.56 YES NO Range:  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.91  Result: D. 61 p.
Temp. Considerate (mg/L)    1/38   0.284   8.31   7.47   72.29.56   YES   NO   Range: Result: 0.61 a.9/L
Time: No. Result: 0.61 mg/L  Result: 0.61 mg/L  Result: 0.61 mg/L  Result: 0.61 mg/L  Result: 0.61 mg/L  Result: 0.61 mg/L  MS/MSD: Yes/00  Result: 0.61 mg/L  MS/MSD: Yes/00  Result: 0.61 mg/L  MS/MSD: Yes/00  Result: 0.61 mg/L  MS/MSD: Yes/00  Result: 0.61 mg/L  MS/MSD: Yes/00  Result: 0.61 mg/L  MS/MSD: Yes/00  Result: 0.61 mg/L  MS/MSD: Yes/00  Result: 0.61 mg/L  MS/MSD: Yes/00  Result: 0.61 mg/L  MS/MSD: Yes/00  Result: 0.61 mg/L  MS/MSD: Yes/00  Result: 0.61 mg/L  MS/MSD: Yes/00  Result: 0.61 mg/L  MS/MSD: Yes/00  Result: 0.61 mg/L  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00  MS/MSD: Yes/00
E NAME: Smokey Mountain Smelters  SITE LOCATION: Knoxville, Tennessee  DATE: 6/22/14  MPLE ID: SMSSW1  SAMPLE TIME: 1545  Temp. Conductan Coxygen (standard units) (mV) That b (hormium (Must Filter) Fe (capsule) (mV) (mV) Fe (capsule) (MSF)  45 20.94 0.404 1.30 8.02 98.1 4.66 YES NO Result: 0.0 mg/L  d Filtered: Yes/NO Filter Size: Duplicate: Yes/NO Duplicate ID: Time: MS/MSD: Yes/NO Collection (MSF)  MPLER(S) SIGNAPURE:
E NAME: Smokey Mountain Smelters  SITE LOCATION: Knoxville, Tennessee  DATE: 6 22 14  MPLE ID: SMSSW1  SAMPLE TIME: 15 45  SAMPLE TIME: 15 45  Image: Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conductan Conduc
MPLE ID: SMSSWII  Temp. Conductan ce ms/cm of µS/cm (mg/L) wints)  Hexavalent Chromlum (Must Filter)  Fe (capsule)  Fe (capsule)  Fe (capsule)  Range:  Result: 0.0 mg/L  d Filtered: Yes (No) Filter Size: Duplicate: Yes (No) Duplicate ID: Time: MS/MSD: Yes No  MPLER(S) SIGNATURE:  MS/MSD: Co //c  C/6 // O
MPLE ID: SMSSWII  Temp. Conductan ce ms/cm of µS/cm (mg/L) wints)  Hexavalent Chromlum (Must Filter)  Fe (capsule)  Fe (capsule)  Fe (capsule)  Range:  Result: 0.0 mg/L  d Filtered: Yes (No) Filter Size: Duplicate: Yes (No) Duplicate ID: Time: MS/MSD: Yes No  MPLER(S) SIGNATURE:  MS/MSD: Co //c  C/6 // O
MPLE ID: SMSSWII  Temp. Conductan ce ms/cm of µS/cm (mg/L) wints)  Hexavalent Chromlum (Must Filter)  Fe (capsule)  Fe (capsule)  Fe (capsule)  Range:  Result: 0.0 mg/L  d Filtered: Yes (No) Filter Size: Duplicate: Yes (No) Duplicate ID: Time: MS/MSD: Yes No  MPLER(S) SIGNATURE:  MS/MSD: Co //c  C/6 // O
MPLE ID: SMSSWII  Temp. Conductan ce ms/cm of µS/cm (mg/L) wints)  Hexavalent Chromlum (Must Filter)  Fe (capsule)  Fe (capsule)  Fe (capsule)  Range:  Result: 0.0 mg/L  d Filtered: Yes (No) Filter Size: Duplicate: Yes (No) Duplicate ID: Time: MS/MSD: Yes No  MPLER(S) SIGNATURE:  MS/MSD: Co //c  C/6 // O
Temp. (°C) conductan ce ms/cm or µS/cm (mg/L) (standard units) (mV) (NTU) (Must Filter) (Must Filter) (Must Filter) (Fe (capsule) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter) (Must Filter
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YES NO Range:
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Page 1 of 2

### J.M. Waller Associates, Inc. Remedial Action Contract II Lite, Region IV, Photo Log

**SIGNATURE** 

**Date:** 

Contract:	EP-S4-08-03	Site Name:	Smokey Mountain Smelters
Task No.:	019	Date:	May 2011
RPM:	Rusty Kestle	Project Mgt.:	Janice Austin
		1110101	
technology (DF Mountain Sme	PT) in the former sett	ling ponds, UST remov hs presented in this ph	subsurface soil investigation utilizing a direct-push val area, and former transformer area at Smokey noto log are of the 5-foot-long cores with the United
		A CUNIONII ED	CENTENTES
		ACKNOWLED	GEMENTS

PM SIGNATURE

Date:



### OFFICIAL PHOTOGRAPH NO. 1 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node **Date:** May 9, 2011

J08

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 0.0 - 5.0 ft. interval of soil boring SMS-J08, with the top part of the boring in the right portion of

this photo. In the 3.0 - 5.0 ft. section, a PID response of 1.1 ppm was detected. The soil is described

as:

0.0 - 3.0 ft.: SILTY CLAY (CL); Red; Dry; Hard; Low Plasticity,

3.0 - 5.0 ft.: SILTY CLAYEY SAND (SM/SC); Gray; Moist; Hard; Angular; Medium Grained; Well

Graded; Some Gravel.



### OFFICIAL PHOTOGRAPH NO. 2 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node Date: May 9, 2011

J08

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 5.0 - 6.5 ft. interval of soil boring SMS-J08, with the top part of the boring in the right portion of

this photo. This is the first of two initial boring attempts where refusal was encountered in the 5.0 - 10.0 ft. zone. The boring was offset approximately 3ft. between attempts and the third attempt was

logged and recorded in photo number DSCN0130.



#### OFFICIAL PHOTOGRAPH NO. 3 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node J08 Date: May 9, 2011

306

Photo Number: DSCN0130 Time: 0905

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 5.0 - 10.0 ft. interval of soil boring SMS-J08, with the top part of the boring in the right portion of

this photo. In this interval, a PID response was not detected. The soil is described as:

5.0 - 5.5 ft.: SILTY CLAYEY SAND (SM/SC); Gray; Moist; Hard; Angular; Medium Grained; Well

Graded; Some Gravel.

5.5 - 6.0 ft.: SILTY SAND (SM); Tan/Blue; Moist; Dense; Well Graded; Medium Grained; Angular.

6.0 - 6.5 ft.: SANDY SILT (ML); Gray; Moist; Hard; Non-Plastic.

6.5 - 10.0 ft.: NO RECOVERY



#### OFFICIAL PHOTOGRAPH NO. 4 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node J08 Date: May 9, 2011

Photo Number: DSCN0131 Time: 0916

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 10.0 - 15.0 ft. interval of soil boring SMS-J08, with the top part of the boring in the right portion

of this photo. In the 10.0 - 10.5 ft. a PID response of 0.1 ppm was detected. The soil is described as:

10.0 - 10.5 ft.: SANDY SILT (ML); Gray; Moist; Hard; Non-Plastic,

10.5 - 12.0 ft.: CLAY (CH); Orange; Moist; Hard; Plastic.

12.0 - 15.0 ft.: NO RECOVERY



### **OFFICIAL PHOTOGRAPH NO. 5** U.S. ENVIRONMENTAL PROTECTION AGENCY

Former Settling Ponds, Center of Node **Location:** 

J08

Date: May 9, 2011

**DSCN0132** Time: 0941 **Photo Number:** 

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 15.0 - 20.0 ft. interval of soil boring SMS-J08, with the top part of the boring in the right portion

of this photo. In this interval a PID response of 0.3 ppm was detected. The soil is described as:

15.0 - 20.0 ft.: CLAY (CH); Orange; Moist; Hard; Plastic.



### OFFICIAL PHOTOGRAPH NO. 6 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node J08 Date: May 9, 2011

300

**Photo Number:** DSCN0133 Time: 1006

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 20.0 - 25.0 ft. interval of soil boring SMS-J08, with the top part of the boring in the right portion

of this photo. In this interval, a PID response was not detected. The soil is described as:

20.0 - 25.0 ft.: CLAY (CH); Orange; Moist; Hard; Plastic. Note: 25.0 - 30.0 ft. - NO RECOVERY.(no photograph)

30.0 ft.: Total depth.



#### OFFICIAL PHOTOGRAPH NO. 7 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Between Nodes J08 & K08 Date: May 9, 2011

Photo Number: DSCN0134 Time: 1127

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 0.0 - 5.0 ft. interval of soil boring SMS-J/K08, with the top part of the boring in the right portion

of this photo. In this interval, a PID response was not detected. The soil is described as:

0.0 - 3.0 ft.: SILTY CLAY (CL); Red; Dry; Hard; Low Plasticity

3.0 - 5.0 ft.: SILTY CLAYEY SAND (SM/SC); Gray; Moist; Dense; Well Graded; Angular; Medium

Grained; Some Gravel.



### OFFICIAL PHOTOGRAPH NO. 8 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Between Nodes

Date: May 9, 2011

J08 & K08

Orientation: -

**Photo Number:** 

**Photographer:** Andrew Grimmke, JMWA

**DSCN0135** 

**Subject:** The 5.0 - 10.0 ft. interval of soil boring SMS-J/K08, with the top part of the boring in the right portion

of this photo. In this interval a PID response of 1.0 ppm was detected. The soil is described as: 5.0 - 10.0 ft.: SILTY CLAYEY SAND (SM/SC); Gray; Moist; Hard; Angular; Medium Grained;

Time:

1135

Well Graded; Some Gravel.



#### OFFICIAL PHOTOGRAPH NO. 9 U.S. ENVIRONMENTAL PROTECTION AGENCY

Former Settling Ponds, Between Nodes **Location:** Date: May 9, 2011

J08 & K08

**DSCN0136** Time: **Photo Number:** 1143

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 10.0 - 15.0 ft. interval of soil boring SMS-J/K08, with the top part of the boring in the right

portion of the photo. In this interval, a PID response of 24.2 ppm was detected. The soil is described

as:

10.0 - 15.0 ft.: SILTY CLAYEY SAND (SM/SC); Gray; Moist; Very Soft; Angular; Medium

Grained; Well Graded; Some Gravel.



# OFFICIAL PHOTOGRAPH NO. 10 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Between Nodes J08 & K08 Date: May 9, 2011

Photo Number: DSCN0137 Time: 1151

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 15.0 - 20.0 ft. interval of soil boring SMS-J/K08. The top part of the boring is in the right portion

of the photo. In this interval a PID response of 10.7 ppm was detected. The soil is described as: 10.0 - 15.0 ft.: SILTY CLAYEY SAND (SM/SC); Light Gray; Moist; Very Soft; Angular; Medium

Grained; Well Graded; Some Gravel.

19.0 - 20.0 ft.: CLAY (CH); Orange; Moist; Hard; Plastic.

20.0 ft.: Total depth.



#### OFFICIAL PHOTOGRAPH NO. 11 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node J09 Date: May 9, 2011

309

Photo Number: DSCN0138 Time: 1452

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 0.0 - 5.0 ft. interval of soil boring SMS-J09, with the top part of the boring in the right portion of

this photo. In the 2.5 - 4.5 ft. section, a PID response of 85.3 ppm was detected. The soil is described

as:

0.0 - 2.5 ft.: SILTY CLAY (CL); Red; Dry; Hard; Low Plasticity (Cap)

2.5 - 4.5 ft.: SILTY SAND (SM); Gray; Wet; Medium Dense; Poorly Graded; Medium Grained; Sub-

angular.

4.5 - 5.0 ft.: ASPHALT



### OFFICIAL PHOTOGRAPH NO. 12 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node J09 Date: May 9, 2011

Photo Number: DSCN0139 Time: 1500

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

Subject: The 5.0 - 10.0 ft. interval of soil boring SMS-J09, with the top part of the boring in the right portion of

this photo. In the 5.0 - 5.5 ft. section, a PID response of 209 ppm was detected. The soil is described

as:

5.0 - 5.5 ft.: SILTY SAND (SM); Gray; Moist; Dense; Poorly Graded; Angular.

5.5 - 7.0 ft.: CLAY (CH); Red; Moist; Hard; Plastic.

7.0 - 10.0 ft.: NO RECOVERY



### **OFFICIAL PHOTOGRAPH NO. 13** U.S. ENVIRONMENTAL PROTECTION AGENCY

Former Settling Ponds, Center of Node **Location:** Date: May 9, 2011

J09

**DSCN0140** Time: 1508 **Photo Number:** 

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 10.0 - 15.0 ft. interval of soil boring SMS-J09, with the top part of the boring in the right portion

of this photo. In this interval a PID response of 6.4 ppm was detected. The soil is described as:

10.0 - 15.0 ft.: SANDY SILT (ML); Gray; Wet; Hard to soft (Sludge?).



### **OFFICIAL PHOTOGRAPH NO. 14** U.S. ENVIRONMENTAL PROTECTION AGENCY

Former Settling Ponds, Center of Node May 9, 2011 **Location:** Date:

J09

**DSCN0141** Time: **Photo Number:** 1521

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 15.0 - 20.0 ft. interval of soil boring SMS-J09, with the top part of the boring in the right portion

of this photo. In this interval a PID response of 5.8 ppm was detected. The soil is described as:

15.0 - 20.0 ft.: SANDY SILT (ML); Gray; Wet; Soft (Sludge?).



### OFFICIAL PHOTOGRAPH NO. 15 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node J09 Date: May 9, 2011

Photo Number: DSCN0142 Time: 1534

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 20.0 - 25.0 ft. interval of soil boring SMS-J09, with the top part of the boring in the right portion

of this photo. In this interval a PID response of 4.1 ppm was detected. The soil is described as:

20.0 - 21.5 ft.: SANDY SILT (ML); Gray; Wet; Soft (Sludge?).

21.5 - 25.0 ft.: NO RECOVERY.



### OFFICIAL PHOTOGRAPH NO. 16 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node J09 Date: May 9, 2011

Photo Number: DSCN0144 Time: 1549

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 25.0 - 26.0 ft. interval of soil boring SMS-J09, with the top part of the boring in the right portion

of the photo. In this interval a PID response of 0.2 ppm was detected. The soil is described as:

25.0 - 26.0 ft.: SANDY SILT (ML); Gray; Wet; Soft (Sludge?).

26.0 ft.: Total depth (gray limestone in sampler).



### OFFICIAL PHOTOGRAPH NO. 17 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node J10 Date: May 10, 2011

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 0.0-5.0 ft. interval of soil boring SMS-J10, with the top part of the boring in the right portion of

the photo. In the 2.5 - 3.5 ft. interval, a PID response of 1.7 ppm was detected. The soil is described

as:

0.0 - 2.5 ft.: SILTY CLAY (CL); Red; Dry; Hard; Low Plasticity (Cap) 2.5 - 3.5 ft.: CLAY (CH); Orange; Moist; Hard; Plastic; Some Cobble.

3.5 - 5.0 ft.: NO RECOVERY



### OFFICIAL PHOTOGRAPH NO. 18 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node J10 Date: May 10, 2011

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 5.0 - 10.0 ft. interval of soil boring SMS-J10, with the top part of the boring in the right portion of

the photo. In the 5.0 - 6.5 ft. interval, a PID response of 1.4 ppm was detected. The soil is described

as:

5.0 - 6.5 ft.: SILTY SAND (SM); Gray; Moist; Dense; Well Graded; Fine Grained; Sub-Angular;

some Gravel

6.5 - 7.5 ft.: Limestone Cobbles 7.5 - 10.0 ft.: NO RECOVERY



### OFFICIAL PHOTOGRAPH NO. 19 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node J10 Date: May 10, 2011

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 10.0 - 15.0 ft. interval of soil boring SMS-J10, with the top part of the boring in the right portion

of the photo. In this interval, a PID response was not detected. The soil is described as: 10.0 - 13.0 ft.: SILTY SAND (SM): Gray; Moist; Dense; With Red Limestone Cobbles.

13.0 - 14.0 ft.: SILTY SAND (SM): Gray grading to Orange; Wet; Medium Dense.

14.0 - 15.0 ft.: NO RECOVERY



# OFFICIAL PHOTOGRAPH NO. 20 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node J10 Date: May 10, 2011

Photo Number: DSCN0149 Time: 0737

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 15.0 - 20.0 ft. interval of soil boring SMS-J10, with the top part of the boring in the right portion

of the photo. In this interval, a PID response was not detected. The soil is described as:

15.0 - 16.0 ft.: SILTY SAND (SM): Gray; Wet; Dense. 16.0 - 17.5 ft.: NO RECOVERY; very soft material

17.5 - 20.0 ft.: SILT (ML); Gray; Wet; Soft; Non-plastic; Organic odor (sludge?)



# OFFICIAL PHOTOGRAPH NO. 21 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node J10 Date: May 10, 2011

Photo Number: DSCN0150 Time: 0748

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 20.0 - 24.0 ft. interval of soil boring SMS-J10, with the top part of the boring in the right portion

of the photo. In this interval, a PID response was not detected. The soil is described as:

20.0 - 23.0 ft.: SILT (ML); Gray; Wet; Soft; Non-plastic; Organic odor (sludge?)

23.0 - 24.0 ft.: SILTY SAND (SM); Orange/Brown; Wet; Dense; Fine Grained; Sub-angular.

24.0 ft.: Total depth.



### OFFICIAL PHOTOGRAPH NO. 22 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node I10 Date: May 10, 2011

Photo Number: DSCN0151 Time: 0831

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 0.0 - 5.0 ft. interval of soil boring SMS-I10, with the top part of the boring in the right portion of

the photo. In the 3.0 to 5.0 ft. section, a PID response of 2.3 ppm was detected. The soil is described

as:

0.0 - 3.0 ft.: SILTY CLAY (CL); Red; Dry; Hard; Low Plasticity (Cap)

3.0 - 5.0 ft.: SILTY SAND (SM); Gray; Wet; Medium Dense; Fine Grained; Poorly Graded; Sub-

angular.



### OFFICIAL PHOTOGRAPH NO. 23 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node I10 Date: May 10, 2011

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 5.0 - 10.0 ft. interval of soil boring SMS-II0, with the top part of the boring in the right portion of

the photo. In the 5.0 to 8.5 ft. section, a PID response of 82.2 ppm was detected. The soil is described

as:

5.0 - 8.5 ft.: SILTY SAND (SM); Gray; Wet; Medium Dense; Fine Grained; Poorly Graded; Sub-

angular, some wood fragments. 8.5 - 10.0 ft.: NO RECOVERY



### OFFICIAL PHOTOGRAPH NO. 24 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node I10 Date: May 10, 2011

**Photo Number:** DSCN0153 Time: 0907

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 10.0 - 15.0 ft. interval of soil boring SMS-II0, with the top part of the boring in the right portion

of the photo. In this interval a PID response of 32.0 ppm was detected. The soil is described as:

10.0 - 11.0 ft.: SANDY SILT (ML); Dark Gray; Wet; Stiff; Non-Plastic; Cohesive

11.0 - 15.0 ft.: NO RECOVERY



### OFFICIAL PHOTOGRAPH NO. 25 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node I10 Date: May 10, 2011

**Photo Number:** DSCN0154 Time: 0914

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 15.0 - 20.0 ft. interval of soil boring SMS-II0 with the top part of the boring in the right portion of

the photo. In this interval a PID response of 0.6 ppm was detected. The soil is described as:

15.0 – 20.0 ft.: CLAY (CH); Orange; Wet; Soft; Plastic.



# OFFICIAL PHOTOGRAPH NO. 26 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node I10 Date: May 10, 2011

Photo Number: DSCN0155 Time: 0925

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 20.0 - 25.0 ft. interval of soil boring SMS-II0 with the top part of the boring in the right portion of

the photo. In this interval a PID response of 0.6 ppm was detected. The soil is described as:

20.0 – 22.0 ft.: CLAY (CH); Orange; Wet; Soft; Plastic.

22.0 - 25.0 ft.: SILTY CLAY (CH); Gray Mottled; Wet; Stiff; Plastic



# OFFICIAL PHOTOGRAPH NO. 27 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node I10 Date: May 10, 2011

**Photo Number:** DSCN0156 Time: 0943

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 25.0 - 29.0 ft. interval of soil boring SMS-II0 with the top part of the boring in the right portion of

the photo. In this interval a PID response of 0.2 ppm was detected. The soil is described as:

25.0 – 26.5 ft.: SILTY CLAY (CH); Gray Mottled; Wet; Stiff; Plastic.

26.5 - 29.0 ft.: NO RECOVERY.

29.0 ft.: Total depth.



# OFFICIAL PHOTOGRAPH NO. 28 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node I9 **Date:** May 10, 2011

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 0.0 - 5.0 ft. interval of soil boring SMS-I9 with the top part of the boring in the right portion of the

photo. In the 2.0 - 5.0 ft. section, a PID response of 0.8 ppm was detected. The soil is described as:

0.0 - 2.0 ft.: SILTY CLAY (CL); Red; Dry; Hard; Low Plasticity (Cap).

2.0 - 5.0 ft.: SILTY SAND (SM); Gray; Wet; Dense; Fine Grained; Well Graded; Some Gravel.



### OFFICIAL PHOTOGRAPH NO. 29 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node I9 **Date:** May 10, 2011

Photo Number: DSCN0158 Time: 1038

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 5.0 - 10.0 ft. interval of soil boring SMS-I9 with the top part of the boring in the right portion of

the photo. In the 5.0 - 6.0 ft. section, a PID response of 1.4 ppm was detected. The soil is described as:

5.0 - 6.0 ft.: SILTY SAND (SM); Gray; Wet; Dense; Fine Grained; Well Graded; Some Gravel.

6.0 - 8.0 ft.: CLAY (CH); Orange; Moist; Hard; Plastic

8.0 - 9.0 ft.: SILTY SAND (SM); Gray; Wet; Loose to Medium Dense; Fine Grained; Poorly Graded

9.0 - 10.0 ft.: SILTY CLAY (CL); Gray to Orange; Moist; Hard; Non-Plastic



# OFFICIAL PHOTOGRAPH NO. 30 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node I9 **Date:** May 10, 2011

Photo Number: DSCN0159 Time: 1058

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 10.0 - 15.0 ft. interval of soil boring SMS-I9 with the top part of the boring in the right portion of

the photo. In the 5.0 - 14.5 ft. section, a PID response of 217 ppm was detected. The soil is described

as:

10.0 – 14.5 ft.: SILTY CLAY (CL); Gray to Orange; Wet; Hard; Non-Plastic, Grading Sandy

Oil Sheen and Odor at 13.5 ft. (also cloth material) 14.5 - 15.0 ft.: CLAY (CH); Orange; Wet; Soft; Plastic



# OFFICIAL PHOTOGRAPH NO. 31 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node I9 **Date:** May 10, 2011

**Photo Number:** DSCN0160 **Time:** 1110

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 15.0 - 20.0 ft. interval of soil boring SMS-I9 with the top part of the boring in the right portion of

the photo. In the 15.0 - 17.5 ft. section, a PID response of 0.8 ppm was detected. The soil is described

as:

15.0 - 17.5 ft.: CLAY (CH); Orange; Wet; Soft; Plastic

17.5 - 20.0 ft.: NO RECOVERY



# OFFICIAL PHOTOGRAPH NO. 32 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former Settling Ponds, Center of Node I9 **Date:** May 10, 2011

**Photo Number:** DSCN0161 Time: 1119

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 20.0 - 25.0 ft. interval of soil boring SMS-I9 with the top part of the boring in the right portion of

the photo. In the 20.0 ft. section, a PID response of 0.9 ppm was detected. The soil is described as:

20.0 – 23.5 ft.: CLAY (CH); Orange; Wet; Soft; Plastic

23.5 - 25.0 ft.: NO RECOVERY;

25.0 ft.: Total depth.



# OFFICIAL PHOTOGRAPH NO. 33 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Former settling ponds, between Nodes

110 and 111

Date: May 10, 2011

J10 and J11

Photo Number: DSCN0162 Time: 1152

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 0.0 - 5.0 ft. interval of soil boring SMS-J10/11, with the top part of the boring in the right portion

of the photo. In the 3.0 ft. section, a PID response of 0.2 ppm was detected. The soil is described as:

0.0 - 1.0 ft.: SILTY CLAY (CL); Red; Dry; Hard; Low Plasticity (Cap)

1.0 - 3.5 ft.: SANDY CLAY (CL); Gray; Moist; Hard; Non-Plastic; Some Gravel and Asphalt

3.5 - 5.0 ft.: NO RECOVERY



### OFFICIAL PHOTOGRAPH NO. 34 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former settling ponds, between Nodes J10 and J11 Date: May 10, 2011

Photo Number: DSCN0163 Time: 1206

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 5.0 - 10.0 ft. interval of soil boring SMS-J10/11, with the top part of the boring in the right portion

of the photo. In the 5.0 ft. section, a PID response of 1.1 ppm was detected. The soil is described as:

5.0 - 5.5 ft.: Same as 1.0 - 3.5' above except with blue/tan sandy waste material

5.5 - 8.0 ft.: SILTY CLAY (CH); Gray/Brown; Wet; Soft; Plastic

8.0 - 10.0 ft.: SILTY SAND (SM); Gray; Wet; Medium Dense; Fine Grained; Poorly Graded; Sub-

rounded



# OFFICIAL PHOTOGRAPH NO. 35 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former settling ponds, between Nodes J10 and J11 Date: May 10, 2011

Photo Number: DSCN0164 Time: 1214

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 10.0 - 15.0 ft. interval of soil boring SMS-J10/11, with the top part of the boring in the right

portion of the photo. In this interval, a PID response was not detected. The soil is described as:

10.0 - 11.0 ft.: SILTY SAND (SM); Gray; Wet; Medium Dense; Fine Grained; Poorly Graded; Sub-

rounded.

11.0 - 15.0 ft.: SLUDGE; Light Gray; Very Soft; Non-plastic.



# OFFICIAL PHOTOGRAPH NO. 36 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former settling ponds, between Nodes J10 and J11 Date: May 10, 2011

Photo Number: DSCN0165 Time: 1229

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 15.0 - 20.0 ft. interval of soil boring SMS-J10/11, with the top part of the boring in the right

portion of the photo. In this interval, a PID response was not detected. The soil is described as:

15.0 - 20.0 ft.: CLAY (CH); Orange; Wet; Stiff; Plastic.

20.0 ft.: Total depth.



# OFFICIAL PHOTOGRAPH NO. 37 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former settling ponds, between of Nodes

Date: May 10, 2011

J8 and K8

Photo Number: DSCN0166 Time: 1354

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 0.0 - 5.0 ft. interval of soil boring SMS-K8, with the top part of the boring in the right portion of

the photo. In the 4.0 ft. section, a PID response of 0.1 ppm was detected. The soil is described as:

0.0 - 3.0 ft.: SILTY CLAY (CL); Red; Dry; Hard; Low Plasticity (Cap)

3.0 - 5.0 ft.: SILTY SAND (SM); Gray; Moist; Medium Dense; Fine Grained; Poorly Graded; Sub-

angular



# OFFICIAL PHOTOGRAPH NO. 38 U.S. ENVIRONMENTAL PROTECTION AGENCY

Former settling ponds, between of Nodes **Location:** Date:

May 10, 2011 J8 and K8

**DSCN0167** Time: **Photo Number:** 1405

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 5.0 - 10.0 ft. interval of soil boring SMS-K8, with the top part of the boring in the right portion of

> the photo. In the 5.0 ft. section, a PID response of 0.1 ppm was detected. The soil is described as: 5.0 - 6.0 ft.: SILTY SAND (SM); Gray; Moist; Medium Dense; Fine Grained; Poorly Graded; Sub-

angular

6.0 - 10.0 ft.: NO RECOVERY



# **OFFICIAL PHOTOGRAPH NO. 39** U.S. ENVIRONMENTAL PROTECTION AGENCY

Former settling ponds, between of Nodes **Location:** Date:

J8 and K8

May 10, 2011

**DSCN0168** Time: **Photo Number:** 1417

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 10.0 - 15.0 ft. interval of soil boring SMS-K8, with the top part of the boring in the right portion

> of the photo. In the 10.0 ft. section, a PID response of 2.2 ppm was detected. The soil is described as: 10.0 - 13.0 ft.: SILTY CLAY (CL); Orange/Gray; Moist; Hard; Non-plastic; Some Sand and Gravel

13.0 - 15.0 ft.: SILTY CLAY (CL); Gray; Wet; Soft



# **OFFICIAL PHOTOGRAPH NO. 40** U.S. ENVIRONMENTAL PROTECTION AGENCY

Former settling ponds, between of Nodes **Location:** Date:

J8 and K8

May 10, 2011

**DSCN0169** Time: **Photo Number:** 1425

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 15.0 - 20.0 ft. interval of soil boring SMS-K8, with the top part of the boring in the right portion

of the photo. In the 15.0 ft. section, a PID response of 1.4 ppm was detected. The soil is described as:

15.0 - 16.5 ft.: SILTY CLAY (CL); Gray; Wet; Soft, with wood.

16.5 - 18.5 ft.: CLAY (CH); Orange; Wet; Firm; Plastic

18.5 - 20.0 ft.: NO RECOVERY



# OFFICIAL PHOTOGRAPH NO. 41 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former settling ponds, between of Nodes J8 and K8 Date: May 10, 2011

Photo Number: DSCN0170 Time: 1437

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 20.0 - 25.0 ft. interval of soil boring SMS-K8, with the top part of the boring in the right portion

of the photo. In this interval, a PID response was not detected. The soil is described as:

20.0 – 25.0 ft.: CLAY (CH); Orange; Wet; Firm; Plastic.

Note: No photo taken of 25.0 to 29.0, but it is described as the same as 20.0 to 25.0 ft.

29.0 ft.: Total Depth.



# OFFICIAL PHOTOGRAPH NO. 42 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former UST Area, within Node J7 **Date:** May 11, 2011

**Photo Number:** DSCN0171 Time: 0636

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 0.0 - 5.0 ft. interval of soil boring SMS-J7, with the top part of the boring in the right portion of

the photo. In the 3.0 ft. section, a PID response of 0.3 ppm was detected. The soil is described as:

0.0 - 2.5 ft.: SILTY CLAY (CL); Red; Dry; Hard; Low Plasticity (Cap)

2.5 - 5.0 ft.: SILTY SAND (SM); Gray; Wet; Dense; Well Graded; Fine Grained; Some Gravel



# OFFICIAL PHOTOGRAPH NO. 43 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former UST Area, within Node J7 **Date:** May 11, 2011

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 5.0 - 10.0 ft. interval of soil boring SMS-J7, with the top part of the boring in the right portion of

the photo. In the 5.0 ft. section, a PID response of 3.2 ppm was detected. The soil is described as: 5.5 - 6.0 ft.: SILTY SAND (SM); Gray; Wet; Dense; Well Graded; Fine Grained; Some Gravel 6.0 - 9.0 ft.: SILTY CLAY (CL); Dark Gray; Moist; Hard; Non-plastic; some cobbles, wood fibers,

possible fuel odor.

9.0 - 10.0 ft.: SILTY CLAY (CH); Orange; Moist; Stiff; Plastic.



# OFFICIAL PHOTOGRAPH NO. 44 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former UST Area, within Node J7 **Date:** May 11, 2011

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 10.0 - 15.0 ft. interval of soil boring SMS-J7, with the top part of the boring in the right portion of

the photo. In the 10.0 ft. section, a PID response of 1.0 ppm was detected. The soil is described as:

10.0 – 15.0 ft.: SILTY CLAY (CH); Grading Brown to Orange; Moist; Stiff; Plastic.



# OFFICIAL PHOTOGRAPH NO. 45 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former UST Area, within Node J7 **Date:** May 11, 2011

**Photo Number:** DSCN0174 Time: 0708

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 15.0 - 20.0 ft. interval of soil boring SMS-J7, with the top part of the boring in the right portion of

the photo. In the 15.0 ft. section, a PID response of 0.3 ppm was detected. The soil is described as:

15.0 – 20.0 ft.: SILTY CLAY (CH); Grading Brown to Orange; Moist; Stiff; Plastic.



# **OFFICIAL PHOTOGRAPH NO. 46** U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former UST Area, within Node J7 Date: May 11, 2011

**Photo Number: DSCN0175** Time: 0717

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 20.0 - 25.0 ft. interval of soil boring SMS-J7, with the top part of the boring in the right portion of

the photo. In this interval, a PID response was not detected. The soil is described as:

20.0 – 25.0 ft.: SILTY CLAY (CH); Grading Brown to Orange; Moist; Stiff; Plastic.



# OFFICIAL PHOTOGRAPH NO. 47 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former UST Area, within Node J7 **Date:** May 11, 2011

**Photo Number:** DSCN0176 Time: 0728

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 25.0 - 29.5 ft. interval of soil boring SMS-J7, with the top part of the boring in the right portion of

the photo. In this interval, a PID response was not detected. The soil is described as: 25.0 - 29.5 ft.: SILTY CLAY (CH); Grading Brown to Orange; Moist; Stiff; Plastic.

29.5 ft.: Total Depth.



# OFFICIAL PHOTOGRAPH NO. 48 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Former UST Area, between of Nodes J7

and 18, South of former UST

Date: May 11, 2011

and J8, South of former UST

**Photo Number:** DSCN0177 Time: 0812

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 0.0 - 5.0 ft. interval of soil boring SMS-J7S, with the top part of the boring in the right portion of

the photo. In the 3.0 ft. section, a PID response of 0.8 ppm was detected. The soil is described as:

0.0 - 2.5 ft.: SILTY CLAY (CL); Red; Dry; Hard; Low Plasticity (Cap)

2.5 - 5.0 ft.: SILTY SAND (SM); Gray; Moist; Medium Dense; Fine Grained; Well Graded; Some

Gravel



# OFFICIAL PHOTOGRAPH NO. 49 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Former UST Area, between of Nodes J7

and 18, South of former UST.

Date: May 11, 2011

and J8, South of former UST

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 5.0 - 10.0 ft. interval of soil boring SMS-J7S, with the top part of the boring in the right portion

of the photo. In the 5.0 ft. section, a PID response of 1.3 ppm was detected. The soil is described as: 5.0 - 10.0 ft.: SILTY SANDY CLAY (CL); Gray to Black; Wet; Hard; Low Plasticity; Layers of

Organic Material; Some Cobbles



### OFFICIAL PHOTOGRAPH NO. 50 U.S. ENVIRONMENTAL PROTECTION AGENCY

Former UST Area, between of Nodes J7 **Location:** Date: May 11, 2011

and J8, South of former UST

**DSCN0179** Time: **Photo Number:** 0822

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 10.0 - 15.0 ft. interval of soil boring SMS-J7S, with the top part of the boring in the right portion

of the photo. In the 10.0 ft. section, a PID response of 0.5 ppm was detected. The soil is described as: 10.0 - 15.0 ft.: SILTY SANDY CLAY (CL); Gray to Black; Wet; Hard; Low Plasticity; Layers of

Organic Material; Some Cobbles

13.0 - 15.0 ft.: SILTY CLAY (CH); Orange; Moist; Hard; Plastic; (Native)

15.0 ft.: Total depth.



# **OFFICIAL PHOTOGRAPH NO. 51** U.S. ENVIRONMENTAL PROTECTION AGENCY

Former UST Area, between Nodes J7 and **Location:** Date: May 11, 2011

K7, East of former UST

**DSCN0180** Time: 0841 **Photo Number:** 

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 0.0 - 5.0 ft. interval of soil boring SMS-J7E, with the top part of the boring in the right portion of

the photo. In the 2.0 ft. section, a PID response of 1.0 ppm was detected. The soil is described as:

0.0 - 2.0 ft.: SILTY CLAY (CL); Red; Dry; Hard; Low Plasticity (Cap) 2.0 - 3.0 ft.: SANDY CLAY (CL); Brown; Wet; Stiff; Low Plasticity

3.0 - 5.0 ft.: NO RECOVERY



# OFFICIAL PHOTOGRAPH NO. 52 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Former UST Area, between Nodes J7 and Date

K7, East of former UST

**Date:** May 11, 2011

Photo Number: DSCN0181 Time: 0848

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 5.0 - 10.0 ft. interval of soil boring SMS-J7E, with the top part of the boring in the right portion

of the photo. In the 5.0 ft. section, a PID response of 0.6 ppm was detected. The soil is described as:

5.0 - 7.5 ft.: Same as 2.0 - 3.0' above except Grading Orange/Brown, Wet, Soft

7.5 - 10.0 ft.: NO RECOVERY



# OFFICIAL PHOTOGRAPH NO. 53 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Former UST Area, between Nodes J7 and Date:

K7, East of former UST

**Date:** May 11, 2011

Photo Number: DSCN0182 Time: 0852

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 10.0 - 15.0 ft. interval of soil boring SMS-J7E, with the top part of the boring in the right portion

of the photo. In the 10.0 ft. section, a PID response of 5.2 ppm was detected. The soil is described as:

10.0 - 15.0 ft.: CLAY (CH); Orange; Moist; Soft; Plastic (Native)

15.0 ft.: Total Depth.



# **OFFICIAL PHOTOGRAPH NO. 54** U.S. ENVIRONMENTAL PROTECTION AGENCY

Former UST Area, within Node J7, North **Location:** 

of former UST

Date: May 11, 2011

**DSCN0183** Time: 0904 **Photo Number:** 

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 0.0 - 5.0 ft. interval of soil boring SMS-J7N, with the top part of the boring in the right portion of

the photo. In the 4.0 ft. section, a PID response of 0.9 ppm was detected. The soil is described as:

0.0 - 3.0 ft.: SILTY CLAY (CL); Red; Dry; Hard; Low Plasticity (Cap)

3.0 - 5.0 ft.: SILTY CLAYEY SAND (SM/SC); Gray; Wet; Medium, Dense, Fine Grained; Well

Graded; Some Gravel.



# OFFICIAL PHOTOGRAPH NO. 55 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former UST Area, within Node J7, North

of former UST

**Date:** May 11, 2011

Photo Number: DSCN0184 Time: 0907

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 5.0 - 10.0 ft. interval of soil boring SMS-J7N, with the top part of the boring in the right portion

of the photo. In the 5.0 ft. section, a PID response of 2.1 ppm was detected. The soil is described as: 5.0 - 7.0 ft.: SANDY CLAY (CL); Brown; Moist; Stiff; Non-plastic; clear, plastic bag material

encountered.



# OFFICIAL PHOTOGRAPH NO. 56 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former UST Area, within Node J7, North

of former UST

**Date:** May 11, 2011

Photo Number: DSCN0185 Time: 0914

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 10.0 - 15.0 ft. interval of soil boring SMS-J7N, with the top part of the boring in the right portion

of the photo. In the 10.0 ft. section, a PID response of 1.8 ppm was detected. The soil is described as:

10.0 - 15.0 ft.: CLAY (CH); Orange; Moist; Stiff; Plastic (Native).

15.0 ft.: Total depth.



# **OFFICIAL PHOTOGRAPH NO. 57** U.S. ENVIRONMENTAL PROTECTION AGENCY

Former UST Area, within Node J7, West **Location:** Date:

May 11, 2011 of former UST

**DSCN0186** Time: **Photo Number:** 0926

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 0.0 - 5.0 ft. interval of soil boring SMS-J7W, with the top part of the boring in the right portion of

the photo. In the 3.0 ft. section, a PID response of 0.1 ppm was detected. The soil is described as:

0.0 - 3.0 ft.: SILTY CLAY (CL); Red; Dry; Hard; Low Plasticity (Cap)

3.0 - 5.0 ft.: SILTY SAND (SM); Gray; Wet; Dense; Fine Grained; Sub-angular; Well Graded; Some

Cobbles.



# OFFICIAL PHOTOGRAPH NO. 58 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Former UST Area, within Node J7, West

of former UST

**Date:** May 11, 2011

Photo Number: DSCN0187 Time: 0938

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 5.0 - 10.0 ft. interval of soil boring SMS-J7W, with the top part of the boring in the right portion

of the photo. In the 5.0 ft. section, a PID response of 0.3 ppm was detected. The soil is described as:

5.0 - 10.0 ft.: CLAY (CH); Orange; Moist; Stiff; Plastic.



# **OFFICIAL PHOTOGRAPH NO. 59** U.S. ENVIRONMENTAL PROTECTION AGENCY

Former UST Area, within Node J7, West **Location:** 

of former UST

Date: May 11, 2011

**DSCN0188** Time: 0946 **Photo Number:** 

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 10.0 - 15.0 ft. interval of soil boring SMS-J7W, with the top part of the boring in the right portion

of the photo. No PID response was detected from this section. The soil is described as:

10.0 - 15.0 ft.: CLAY (CH); Orange; Moist; Stiff; Plastic.

15.0 ft.: Total depth.



# OFFICIAL PHOTOGRAPH NO. 60 U.S. ENVIRONMENTAL PROTECTION AGENCY

Former transformer area, node L4, South **Location:** 

of Platform

May 11, 2011 Date:

**DSCN0189** Time: **Photo Number:** 1052

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 0.0 - 5.0 ft. interval of soil boring SMS-L4S1 (J7W written on board is from previous location),

with the top part of the boring in the right portion of the photo. No PID response was detected from

this section. The soil is described as:

0.0 - 2.0 ft.: SILTY CLAY (CL); Red; Dry; Hard; Low Plasticity

2.0 - 5.0 ft.: NO RECOVERY.



# **OFFICIAL PHOTOGRAPH NO. 61** U.S. ENVIRONMENTAL PROTECTION AGENCY

Former transformer area, node L4, South **Location:** 

of Platform

May 11, 2011 Date:

DSCN0190 Time: 1059 **Photo Number:** 

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 5.0 – 10.0 ft. interval of soil boring SMS-L4S1 (J7W written on board is from previous location),

with the top part of the boring in the right portion of the photo. No PID response was detected from

this section. The soil is described as:

5.0 - 10.0 ft.: SILTY CLAY (CL); Red grading orange; Dry; Hard; Low Plasticity.



#### OFFICIAL PHOTOGRAPH NO. 62 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Former transformer area, node L4, South

of Platforms

Date: May 11, 2011

of Platform

Photo Number: DSCN0191 Time: 1105

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 10.0 - 15.0 ft. interval of soil boring SMS-L4S1 (J7W written on board is from previous

location), with the top part of the boring in the right portion of the photo. In the 10.0 ft. section, a PID

response of 0.6 ppm was detected. The soil is described as:

10.0 - 15.0 ft.: SILTY CLAY (CL); Red grading orange; Dry; Hard; Low Plasticity.



#### OFFICIAL PHOTOGRAPH NO. 63 U.S. ENVIRONMENTAL PROTECTION AGENCY

Former transformer area, node L4, South **Location:** 

of Platform

Date: May 11, 2011

**DSCN0192** Time: **Photo Number:** 1114

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 15.0 – 20.0 ft. interval of soil boring SMS-L4S1 (J7W written on board is from previous

location), with the top part of the boring in the right portion of the photo. In the 15.0 ft. section, a PID

response of 2.3 ppm was detected. The soil is described as:

15.0 - 20.0 ft.: SILTY CLAY (CL); Red grading orange; Dry; Stiff; Low Plasticity.



#### OFFICIAL PHOTOGRAPH NO. 64 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former transformer area, node L4, South of Platform Date: May 11, 2011

Photo Number: DSCN0193 Time: 1123

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 20.0 - 25.0 ft. interval of soil boring SMS- L4S1, with the top part of the boring in the right

portion of the photo. In the 20.0 ft. section, a PID response of 0.3 ppm was detected. The soil is

described as:

20.0 - 25.0 ft.: SILTY CLAY (CL); Red grading orange; Dry; Stiff; Low Plasticity.



#### OFFICIAL PHOTOGRAPH NO. 65 U.S. ENVIRONMENTAL PROTECTION AGENCY

Former transformer area, node L4, South **Location:** 

of Platform

May 11, 2011 Date:

**DSCN0195** Time: **Photo Number:** 1128

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 25.0 - 27.0 ft. interval of soil boring SMS-L4S1, with the top part of the boring in the right

portion of the photo. In the 25.0 ft. section, a PID response of 0.2 ppm was detected. The soil is

described as:

25.0 - 27.0 ft.: SILTY CLAY (CL); Red grading orange; Dry; Stiff; Low Plasticity.

27.0 ft.: Total depth.



#### OFFICIAL PHOTOGRAPH NO. 66 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Former transformer area, node L4, South

of Platforms

Date: May 11, 2011

of Platform

Date: May 11, 201

Photo Number: DSCN0196 Time: 1154

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 0.0 - 5.0 ft. interval of soil boring SMS-L4S2, with the top part of the boring in the right portion

of the photo. In the 0.0 ft. section, a PID response of 0.1 ppm was detected. The soil is described as:

0.0 - 4.0 ft.: CLAY (CH); Orange; Stiff; Moist; Plastic

4.0 - 5.0 ft.: NO RECOVERY. Soil sample collected (0.0 - 5.0 ft.).



#### OFFICIAL PHOTOGRAPH NO. 67 U.S. ENVIRONMENTAL PROTECTION AGENCY

Former transformer area, node L4, South **Location:** 

of Platform

Date: May 11, 2011

**DSCN0197** Time: 1200 **Photo Number:** 

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 5.0 - 10.0 ft. interval of soil boring SMS-L4S2, with the top part of the boring in the right portion

of the photo. In the 5.0 ft. section, a PID response of .0.5 ppm was detected. The soil is described as:

5.0 - 10.0 ft.: CLAY (CH); Orange; Hard; Moist; Plastic.



#### OFFICIAL PHOTOGRAPH NO. 68 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Former transformer area, node L4, South

Date:

of Platform

**Date:** May 11, 2011

Photo Number: DSCN0198 Time: 1206

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 10.0 - 15.0 ft. interval of soil boring SMS-L4S2, with the top part of the boring in the right

portion of the photo. In the 10.0 ft. section, a PID response of 11.2 ppm was detected. The soil is

described as:

10.0 – 13.5 ft.: CLAY (CH); Orange; Hard; Moist; Plastic

13.5 - 15.0 ft.: CLAY (CL); Gray; Wet; Soft

Note: The next photo in sequence to this boring location is Photograph No. 75.



#### **OFFICIAL PHOTOGRAPH NO. 69** U.S. ENVIRONMENTAL PROTECTION AGENCY

Former transformer area, node L4, East **Location:** Date:

side of Platform

May 11, 2011

DSCN0199 Time: **Photo Number:** 1217

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 0.0 - 5.0 ft. interval of soil boring SMS-L4E, with the top part of the boring in the right portion of

the photo. In the 0.0 ft. section, a PID response of 0.2 ppm was detected. The soil is described as:

0.0 – 5.0 ft.: CLAY (CL); Orange; Dry; Hard; Low Plasticity

Soil sample collected (0.0 - 5.0 ft.).



#### OFFICIAL PHOTOGRAPH NO. 70 U.S. ENVIRONMENTAL PROTECTION AGENCY

Former transformer area, node L4, East **Location:** Date: May 11, 2011

side of Platform

**DSCN0200** Time: **Photo Number:** 1219

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 5.0 - 10.0 ft. interval of soil boring SMS-L4E, with the top part of the boring in the right portion

of the photo. In the 5.0 ft. section, a PID response of 0.4 ppm was detected. The soil is described as:

5.0 – 10.0 ft.: CLAY (CL); Orange; Moist; Hard; Low Plasticity



#### OFFICIAL PHOTOGRAPH NO. 71 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Former transformer area, node L4, East side of Platform

Date: May 11, 2011

Photo Number: DSCN0201 Time: 1229

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 10.0 - 15.0 ft. interval of soil boring SMS-L4E, with the top part of the boring in the right portion

of the photo. In the 10.0 ft. section, a PID response of 0.6 ppm was detected. The soil is described as:

10.0 – 15.0 ft.: CLAY (CL); Orange; Moist; Hard; Low Plasticity

15.0 ft.: Total depth.



#### OFFICIAL PHOTOGRAPH NO. 72 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Former transformer area, node L4, North

oids of Plotform

Date: May 11, 2011

side of Platform

Photo Number: DSCN0202 Time: 1250

Orientation: -

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 0.0 - 5.0 ft. interval of soil boring SMS-L4N, with the top part of the boring in the right portion of

the photo. No PID response was detected from this section. The soil is described as. The soil is

described as:

0.0 - 2.0 ft.: SANDY CLAY (CH); Brown/Orange; Wet; Stiff; Plastic

2.0 - 5.0 ft.: NO RECOVERY Soil sample collected (0.0 – 5.0 ft.).



#### **OFFICIAL PHOTOGRAPH NO. 73** U.S. ENVIRONMENTAL PROTECTION AGENCY

Former transformer area, node L4, North **Location:** 

side of Platform

May 11, 2011 Date:

**DSCN0203** Time: **Photo Number:** 1256

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 5.0 - 10.0 ft. interval of soil boring SMS-L4N, with the top part of the boring in the right portion

of the photo. In the 5.0 ft. section, a PID response of 0.1 ppm was detected. The soil is described as:

5.0 - 10.0 ft.: CLAY (CH); Orange; Moist; Hard; Plastic



#### **OFFICIAL PHOTOGRAPH NO. 74** U.S. ENVIRONMENTAL PROTECTION AGENCY

Former transformer area, node L4, North **Location:** Date:

side of Platform

May 11, 2011

**DSCN0204** Time: **Photo Number:** 1304

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 10.0 - 15.0 ft. interval of soil boring SMS-L4N, with the top part of the boring in the right portion

of the photo. In the 10.0 ft. section, a PID response of 0.1 ppm was detected. The soil is described as:

10.0 - 15.0 ft.: CLAY (CH); Orange; Moist; Hard; Plastic

15.0 ft.: Total depth.



#### OFFICIAL PHOTOGRAPH NO. 75 U.S. ENVIRONMENTAL PROTECTION AGENCY

Former transformer area, node L4, South **Location:** Date: May 11, 2011

of Platform

**DSCN0205** Time: **Photo Number:** 1324

**Orientation:** 

**Photographer:** Andrew Grimmke, JMWA

**Subject:** The 15.0 - 20.0 ft. interval of soil boring SMS-L4S2, with the top part of the boring in the right

portion of the photo. In the 15.0 ft. section, a PID response of 17.5 ppm was detected. The soil is

described as:

15.0 - 20.0 ft.: SANDY CLAY (CL); Light Brown, Wet, Soft, Some Cobbles.

20.0 ft.: Total depth.

Note: The photo previous to this boring location is Photograph No. 68.

### J.M. Waller Associates, Inc. Remedial Action Contract II Lite, Region IV, Photo Log

**SIGNATURE** 

Date:

Cask No.:  RPM:  Ouring the wee	019 Rusty Kestle	Date: Project Mgt.:	May 2011 Janice Austin
	Rusty Kestle		Innian Austin
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ui me wee	k of May 2 2011 I I	M Waller Inc. condu	cted surface water/ sediment sampling (includin
			y), benthic macroinvertebrate survey, and fish
			ch, and Knob Creek Embayment. The following
		ities as they occurred	
0 1		·	
		ACKNOWLED	GEMENTS

PM SIGNATURE

Date:



## OFFICIAL PHOTOGRAPH NO.: 1 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW01 – Flenniken Branch **Date:** May 2, 2011

**Photo Number:** 030 Time: 1110

**Orientation:** Southeast

**Photographer:** Tod DeLong, Avatar Environmental

Subject: Sample location, SMSSDSW01 is a background location. Larry Everett, Biologist, Tennessee

Department of Environment and Conservation conducts the macroinvertebrate survey within

Flenniken Branch.



#### OFFICIAL PHOTOGRAPH NO.: 2 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW01 – Flenniken Branch **Date:** May 2, 2011

Photo Number: 031 Time: 1114

**Orientation:** Southeast

**Photographer:** Tod DeLong, Avatar Environmental

**Subject:** Sample location, SMSSDSW01 is a background location. Larry Everett, Biologist, Tennessee

Department of Environment and Conservation conducts the macroinvertebrate survey within

Flenniken Branch.



#### OFFICIAL PHOTOGRAPH NO.: 3 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW01 – Flenniken Branch **Date:** May 2, 2011

Photo Number: 032 Time: 1135

**Orientation:** South

**Photographer:** Tod DeLong, Avatar Environmental

Subject: Sample location, SMSSDSW01 is a background location. Larry Everett, Biologist, Tennessee

Department of Environment and Conservation conducts the macroinvertebrate survey within

Flenniken Branch.



#### OFFICIAL PHOTOGRAPH NO.: 4 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW01 – Flenniken Branch **Date:** May 2, 2011

**Photo Number:** 033 Time: 1135

**Orientation:** South

**Photographer:** Tod DeLong, Avatar Environmental

Subject: Sample location, SMSSDSW01 is a background location. Larry Everett, Biologist and Brooke

Childrey, Intern both of the Tennessee Department of Environment and Conservation conducts the

macroinvertebrate survey within Flenniken Branch.



#### OFFICIAL PHOTOGRAPH NO. 5 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW03 - **Date:** May 2, 2011

Photo Number: NA Time: ~1330

**Orientation:** East

**Photographer:** Jack Kuiper, JMWA

**Subject:** Tod DeLong, Avatar Environmental and C.J. Roebuck, JMWA at SMSSDSW03 on Flenniken Branch.



#### OFFICIAL PHOTOGRAPH NO. 6 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW03 **Date:** May 2, 2011

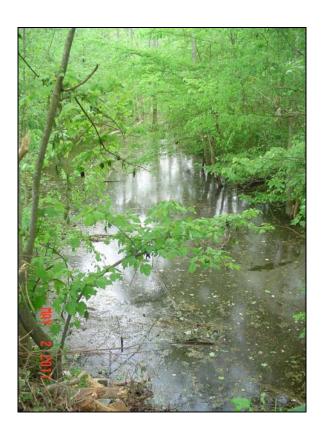
Photo Number: NA Time: 1330

**Orientation:** West

**Photographer:** Jack Kuiper, JMWA

Subject: Larry Everett, Biologist and Brooke Childrey, Intern both of the Tennessee Department of

Environment and Conservation check the suitability of this location to conduct the macroinvertebrate survey within Flenniken Branch. It was determined this location was not suitable for benthic samples.



#### OFFICIAL PHOTOGRAPH NO. 7 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW04 **Date:** May 2, 2011

Photo Number: NA Time: ~1430

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

**Subject:** Wetland west of proposed sample location SMSSDSW04 on Flenniken Branch. It was determined to

move SMSSDSW04 downstream near the Witherspoon property.



#### OFFICIAL PHOTOGRAPH NO. 8 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW04 **Date:** May 2, 2011

Photo Number: NA Time: ~1430

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

Subject: Wetland west of proposed sample location SMSSDSW04 on Flenniken Branch. It was determined to

move SMSSDSW04 downstream near the Witherspoon property.



#### OFFICIAL PHOTOGRAPH NO.: 9 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW06 **Date:** May 3, 2011

Photo Number: NA Time: ~1000

**Orientation:** Northeast

**Photographer:** Jack Kuiper, JMWA

**Subject:** Flenniken Branch, upstream of SMSSDSW06 sample location.



### OFFICIAL PHOTOGRAPH NO.: 10 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW06 **Date:** May 3, 2011

Photo Number: NA Time: ~1000

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

**Subject:** Wetland Area 1 on Flenniken Branch north of SMSSDSW06 sample location. In background a small

island near sample location with wetland plants such as cattails, spike rush, mint, water shamrock and

other grasses.



#### OFFICIAL PHOTOGRAPH NO.: 11 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW06 **Date:** May 3, 2011

Photo Number: NA Time: ~1000

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

**Subject:** Wetland Area 1 on Flenniken Branch north of SMSSDSW06 sample location. In background a small

island near sample location with wetland plants such as spike rush, mint, water shamrock and other

grasses.



#### OFFICIAL PHOTOGRAPH NO.: 12 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW06 **Date:** May 3, 2011

Photo Number: NA Time: ~1000

**Orientation:** Northeast

**Photographer:** Jack Kuiper, JMWA

Subject: Tod DeLong, Avatar Environmental and C.J. Roebuck, JMWA at SMSSDSW06 on Flenniken Branch

and Wetland Area 1.



# OFFICIAL PHOTOGRAPH NO.: 13 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW06 **Date:** May 3, 2011

Photo Number: NA Time: ~1000

**Orientation:** Northeast

**Photographer:** Jack Kuiper, JMWA

Subject: Tod DeLong, Avatar Environmental and C.J. Roebuck, JMWA at SMSSDSW06 on Flenniken Branch

and Wetland Area 1.



# OFFICIAL PHOTOGRAPH NO.: 14 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW06 **Date:** May 3, 2011

Photo Number: NA Time: ~1000

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

Subject: Wetland plant Yellow Flag in Wetland Area 1 on Flenniken Branch near SMSSDSW06 sample

location.



## OFFICIAL PHOTOGRAPH NO.: 15 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW06 **Date:** May 3, 2011

Photo Number: NA Time: ~1000

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

Subject: Wetland Area 1 on Flenniken Branch near SMSSDSW06 sample location. Example of observed

wetland plants.



# OFFICIAL PHOTOGRAPH NO.: 16 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW06 **Date:** May 3, 2011

Photo Number: NA Time: ~1000

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

Subject: Wetland Area 1 on Flenniken Branch near SMSSDSW06 sample location. Example of observed

wetland plants.



## OFFICIAL PHOTOGRAPH NO.: 17 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW06 **Date:** May 3, 2011

Photo Number: NA Time: ~1000

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

Subject: Wetland Area 1 on Flenniken Branch near SMSSDSW06 sample location. Example of observed

wetland plants such as Red Maple, Box Elder, Willow and Sycamore trees.



# OFFICIAL PHOTOGRAPH NO.: 18 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW06 **Date:** May 3, 2011

Photo Number: NA Time: ~1000

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

Subject: Wetland plant Yellow Flag in Wetland Area 1 on Flenniken Branch near SMSSDSW06 sample

location.



#### OFFICIAL PHOTOGRAPH NO.: 19 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW06 **Date:** May 3, 2011

Photo Number: NA Time: ~1000

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

Subject: Wetland plant Yellow Flag in Wetland Area 1 on Flenniken Branch near SMSSDSW06 sample

location.



### OFFICIAL PHOTOGRAPH NO.: 20 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW06 **Date:** May 3, 2011

Photo Number: NA Time: ~1000

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

Subject: Tod DeLong, Avatar Environmental and C.J. Roebuck, JMWA at SMSSDSW06 on Flenniken Branch

and Wetland Area 1.



## OFFICIAL PHOTOGRAPH NO.: 21 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW09 **Date:** May 3, 2011

Photo Number: NA Time: ~1200

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

Subject: Upstream from sampling location SMSSDSW09 on Flenniken Branch. Evidence of actively eroding

bank.



# OFFICIAL PHOTOGRAPH NO.: 22 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW09 **Date:** May 3, 2011

Photo Number: NA Time: ~1200

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

**Subject:** Near sampling location SMSSDSW09 and SMSSW09-Spring on Flenniken Branch.



#### OFFICIAL PHOTOGRAPH NO.: 23 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW09 **Date:** May 3, 2011

Photo Number: NA Time: ~1200

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

**Subject:** Avatar Environmental prepare to collect water quality readings at sampling location SMSSDSW09 on

Flenniken Branch.



# OFFICIAL PHOTOGRAPH NO.: 24 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW09 **Date:** May 3, 2011

Photo Number: NA Time: ~1200

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

**Subject:** Stream bank erosion near sampling location SMSSDSW09 on Flenniken Branch.



#### OFFICIAL PHOTOGRAPH NO.: 25 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW09 **Date:** May 3, 2011

Photo Number: NA Time: ~1200

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

Subject: Examples of observed vegetation, such as Sycamores, Tulip Popluars, Red Maple, Virginia Pine and

Box Elders, near SMSSDSW09 on Flenniken Branch.



# OFFICIAL PHOTOGRAPH NO.: 26 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW09 **Date:** May 3, 2011

Photo Number: NA Time: ~1200

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

**Subject:** Example of observed Honeysuckle Shrub near SMSSDSW09 on Flenniken Branch



# OFFICIAL PHOTOGRAPH NO.: 27 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW09 **Date:** May 3, 2011

Photo Number: NA Time: ~1200

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

**Subject:** Preparing to collect samples at SMSSW09-Spring near Flenniken Branch.



# OFFICIAL PHOTOGRAPH NO.: 28 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW08 **Date:** May 3, 2011

Photo Number: NA Time: ~1300

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

**Subject:** Overview near sample location SMSSDSW08 on Flenniken Branch.



### OFFICIAL PHOTOGRAPH NO.: 29 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW08 **Date:** May 3, 2011

Photo Number: NA Time: ~1300

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

**Subject:** Overview near sample location SMSSDSW08 on Flenniken Branch.



# OFFICIAL PHOTOGRAPH NO.: 30 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW08 **Date:** May 3, 2011

Photo Number: NA Time: ~1300

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

**Subject:** Culvert after heavy rain event near sample location SMSSDSW08 on Flenniken Branch.



# OFFICIAL PHOTOGRAPH NO.: 31 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW08 **Date:** May 3, 2011

Photo Number: NA Time: ~1300

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

**Subject:** Culvert after heavy rain event upstream of sample location SMSSDSW08 on Flenniken Branch.



# OFFICIAL PHOTOGRAPH NO.: 32 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW04 **Date:** May 4, 2011

Photo Number: NA Time: ~0930

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

**Subject:** Wetland Adjacent to sample location SMSSDSW04.



### OFFICIAL PHOTOGRAPH NO.: 33 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW04 **Date:** May 4, 2011

Photo Number: NA Time: ~0930

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

**Subject:** Wetland Adjacent to sample location SMSSDSW04.



# OFFICIAL PHOTOGRAPH NO.: 34 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW04 **Date:** May 4, 2011

Photo Number: NA Time: ~0930

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

Subject: Culvert upstream of sample location SMSSDSW04 The pool was created by a rug that dammed up

the stream downstream of culvert outfall..



#### OFFICIAL PHOTOGRAPH NO.: 35 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW04 **Date:** May 4, 2011

Photo Number: NA Time: ~0930

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

Subject: C.J. Roebuck of J.M. Waller collects water quality readings at sampling location SMSSDSW04 on

Flenniken Branch.



# OFFICIAL PHOTOGRAPH NO.: 36 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW04 **Date:** May 4, 2011

Photo Number: NA Time: ~0930

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

**Subject:** Sampling location SMSSDSW04 on Flenniken Branch with gravelly riffle.



#### OFFICIAL PHOTOGRAPH NO.: 37 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW03 **Date:** May 4, 2011

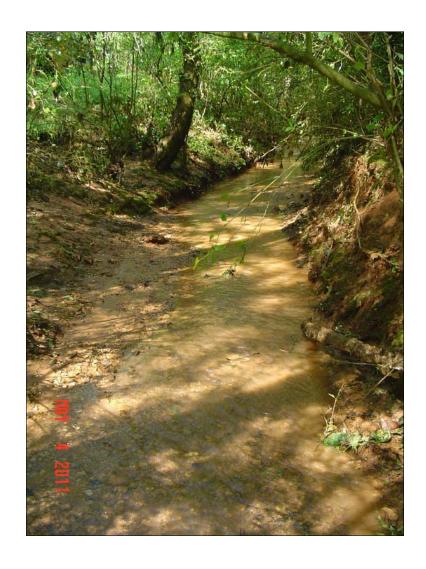
Photo Number: NA Time: ~1030

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

Subject: Sampling location SMSSDSW03, approximately 30 to 40 ft. from confluence of Flenniken Branch

and site discharge channel.



OFFICIAL PHOTOGRAPH NO.: 38 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW03 **Date:** May 4, 2011

Photo Number: NA Time: ~1030

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

**Subject:** Downstream of sampling location SMSSDSW03.



#### OFFICIAL PHOTOGRAPH NO.: 39 U.S. ENVIRONMENTAL PROTECTION AGENCY

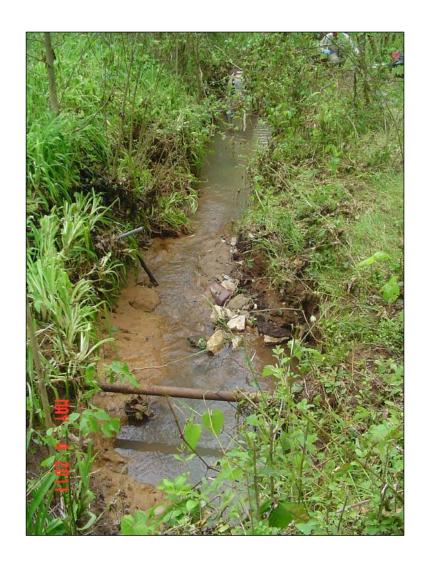
**Location:** SMSSDSW01 **Date:** May 4, 2011

Photo Number: NA Time: ~1145

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

**Subject:** Background sample location SMSSDSW01, approximately 20 to 30 ft. downstream from site culvert. .



# OFFICIAL PHOTOGRAPH NO.: 40 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW01 **Date:** May 4, 2011

Photo Number: NA Time: ~1145

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

**Subject:** Background sample location SMSSDSW01, approximately 20 to 30 ft. downstream from site culvert.

Evidence of pipes sticking out of banks,.



### OFFICIAL PHOTOGRAPH NO.: 41 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW01 **Date:** May 4, 2011

Photo Number: NA Time: ~1145

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

**Subject:** Bank Erosion at sampling location SMSSDSW01.



### OFFICIAL PHOTOGRAPH NO.: 42 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW01 **Date:** May 4, 2011

Photo Number: NA Time: ~1145

**Orientation:** XXXh

**Photographer:** Jack Kuiper, JMWA

**Subject:** Evidence of bank erosion at sampling location SMSSDSW01.



### OFFICIAL PHOTOGRAPH NO.: 43 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW01 **Date:** May 4, 2011

Photo Number: NA Time: ~1145

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

**Subject:** Tod Delong of Avatar Environmental collecting the background sample at location SMSSDSW01..



### OFFICIAL PHOTOGRAPH NO.: 44 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW01 **Date:** May 4, 2011

Photo Number: NA Time: ~1145

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

**Subject:** Evidence of bank erosion / slumping at sample location SMSSDSW01.



#### OFFICIAL PHOTOGRAPH NO.: 45 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW01 **Date:** May 4, 2011

Photo Number: NA Time: ~1145

**Orientation:** NA

**Photographer:** Jack Kuiper, JMWA

**Subject:** Honeysuckle Shrub on bank at sample location SMSSDSW01.



#### OFFICIAL PHOTOGRAPH NO.: 46 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Knob Creek Embayment – I.C. King Park **Date:** May 5, 2011

Photo Number: 038 Time: 0935

**Orientation:** East

**Photographer:** Tim Woods, Avatar Environmental

**Subject:** Fish Collection. Team prepares for electroshocking within the Knob Creek Embayment near the

Flenniken Branch confluence. Photographed: Jim Negus and Rod Lindbom of Tennessee Wildlife

Resource Agency (TWRA) and Tod DeLong, Avatar Environmental.



#### OFFICIAL PHOTOGRAPH NO.: 47 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Knob Creek Embayment – I.C. King Park **Date:** May 5, 2011

Photo Number: 040 Time: 0940

**Orientation:** North

**Photographer:** Tim Woods, Avatar Environmental

**Subject:** Fish Collection. Team deploys nets to capture fish after electroshocking within the Knob Creek

Embayment near the Flenniken Branch confluence (Sample location SMSSDSW05). Photographed: Jim Negus and Rod Lindbom of Tennessee Wildlife Resource Agency (TWRA) and Tod DeLong,

Avatar Environmental.



# OFFICIAL PHOTOGRAPH NO. 48 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Knob Creek Embayment – I.C. King Park **Date:** May 5, 2011

Photo Number: 043 Time: 0955

**Orientation:** South

**Photographer:** Tod DeLong, Avatar Environmental

Subject: Knob Creek Embayment oriented toward Knob Creek confluence. Fishing pier and entrance to IC

King Park shown in the upper left corner.



#### OFFICIAL PHOTOGRAPH NO. 49 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSDSW10 – Knob Creek I.C. King Park Date: May 5, 2011

Photo Number: 044 Time: 1002

**Orientation:** East

**Photographer:** 

Subject: Fish Collection. Team deploys nets to capture fish after electroshocking within the Knob Creek

(Sample location SMSSDSW10). Sample location, SMSSDSW10 is a background location situated upstream of Knob Creek Embayment. Photographed: Jim Negus and Rod Lindbom of Tennessee

Wildlife Resource Agency (TWRA) and Tod DeLong, Avatar Environmental.



### OFFICIAL PHOTOGRAPH NO. 50 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Knob Creek Embayment – IC King Park **Date:** May 5, 2011

Photo Number: 048 Time: 1520

**Orientation:** NA

**Photographer:** Tod DeLong, Avatar Environmental

Subject: Large carp collected in Knob Creek Embayment. Due to the unavailability of catfish within Knob

Creek Embayment, carp was collected.



### OFFICIAL PHOTOGRAPH NO. 51 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Entrance to Smokey Mountain Smelters
Caleb Street near water supply

Date: May 5, 2011

**Photo Number:** 049 Time: 1530

**Orientation:** West

**Photographer:** 

**Subject:** Jack Kuiper, JMWA and Tod DeLong, Avatar Environmental process a fish (carp) for sample

collection.



Creek Near Sampling Location 3



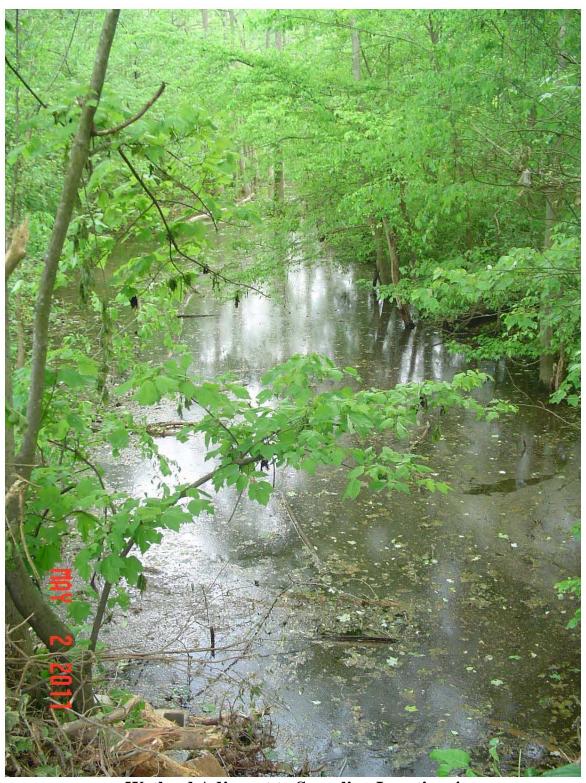
Creek Near Sampling Location 3



Wetland Adjacent to Sampling Location 4



**Upstream Sampling Location 6** 



Wetland Adjacent to Sampling Location 4



Wetland Sampling Location 6



Cattail Wetland, Sampling Location 6



Wetland, Sampling Location 6



Wetland, Sampling Location 6



Yellow Flag, Sampling Location 6



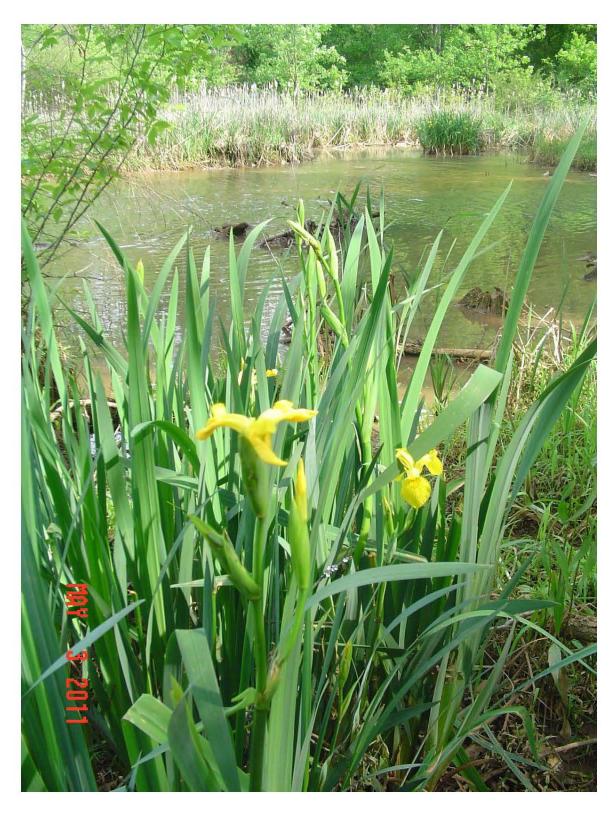
Wetland, Sampling Location 6



Wetland Sampling, Location 6



Wetland, Sampling Location 6



Yellow Flag, Sampling Location 6



**Yellow Flag, Sampling Location 6** 



Wetland, Sampling Location 6



**Upstream from Sampling Location 9** 



**Culvert Sampling Location 9** 



**Sampling Location Site 9** 



**Stream Bank Erosion Sampling Location 9** 



**Near Sampling Location Site 9** 



Honeysuckle Shrub Sampling Location 9



**Spring at Sampling Location 9** 



**Overview Creek Sampling Location 8** 



**Overview Creek Sampling Location 8** 



Sampling Location Creek Site 8



**Upstream of Sampling Location Creek Site 8** 



Wetland Adjacent to Sampling Location 4



Wetland Adjacent to Sampling Location 4



**Culvert/Pool Upstream of Sampling Location 4** 



**Sampling Location 4** 



Sampling Location 4



**Sampling Location 3** 



**Downstream of Sampling Location 3** 



**Downstream of Sampling Location 3, Buffer Lacking** 



**Upstream of Sampling Location 1** 



Bank Erosion at Sampling Location 1



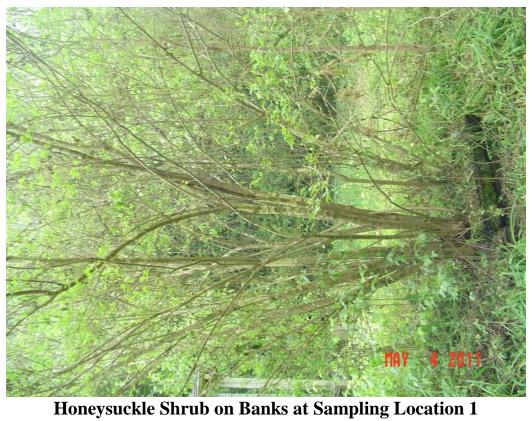
**Bank Erosion at Sampling Location 1** 



Sampling Location 1



Bank Erosion/Slumping at Sampling Location 1



# J.M. Waller Associates, Inc. Remedial Action Contract II Lite, Region IV, Photo Log

Contract: Task No.: RPM:	EP-S4-08-03 019 Rusty Kestle	Site Name: Date: Project Mgt.:	Smokey Mountain June 2011 Janice Austin	Smelters		
PHOTO LOG						
Phase 4 Combusing Survey and dusted on June 6 2011 by University of Tannagae Vicewille						
Phase 4, Geophysical Survey conducted on June 6, 2011 by University of Tennessee, Knoxville.						
ACKNOWLEDGEMENTS						
SIGNATURE	Date:		PM SIGNATURE	Date:		



OFFICIAL PHOTOGRAPH NO. 1 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters **Date:** June 6, 2011

Photo Number: Time:

**Orientation:** East

**Photographer:** Janice Austin

**Subject:** Transect for seismic refraction survey running East to West through the footprint of the former settling

pond. Photographed: Graduate student from University of Tennessee (foreground) and Lee Barron,

TDEC (background).

# J.M. Waller Associates, Inc. Remedial Action Contract II Lite, Region IV, Photo Log

**SIGNATURE** 

Date:

Contract:	EP-S4-08-03	Site Name:	Smokey Mountain Smelters				
Task No.:	019	Date:	September 2011				
RPM:	Rusty Kestle	Project Mgt.:	Janice Austin				
		РНОТО	· · ·				
During the week of September 26, 2011, J. M. Waller, Inc. returned to Smokey Mountain Smelters for							
additional sample collection. The following photographs show the conditions of the drainage ditches on the							
			ample location SMSSWSD02, and the benthic				
macroinvertebrate survey conducted on Flenniken Branch in the vicinity of SMSSWSD11.							
ACKNOWLEDGEMENTS							
1							

PM SIGNATURE

Date:



# OFFICIAL PHOTOGRAPH NO. 1 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters **Date:** September 26, 2011

**Photo Number:** DSCI0104 Time: 1418

**Orientation:** North Northeast

**Photographer:** Janice Austin

Subject: Drainage ditch along east side of Smokey Mountain Smelter Site, upstream of SMSSWSD02. The

ditch sediment was moist, but no evidence of pooling water was found.



# OFFICIAL PHOTOGRAPH NO. 2 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters **Date:** September 26, 2011

**Photo Number:** DSCI0105 Time: 1418

**Orientation:** North northeast

**Photographer:** Janice Austin

**Subject:** Sample location SMSSWSD02 in the Unnamed Tributary south of Smokey Mountain Smelters. The

sediment was moist, however, no water was found.



# OFFICIAL PHOTOGRAPH NO. 3 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters **Date:** September 26, 2011

**Photo Number:** DSCI0106 Time: 1419

**Orientation:** North northeast

**Photographer:** Janice Austin

**Subject:** Sample location SMSSWSD02 in the Unnamed Tributary south of Smokey Mountain Smelters. The

sediment was moist, however, no water was found.



# OFFICIAL PHOTOGRAPH NO. 4 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters **Date:** September 26, 2011

**Photo Number:** DSCI0107 Time: 1419

**Orientation:** North northeast

**Photographer:** Janice Austin

**Subject:** Sample location SMSSWSD02 in the Unnamed Tributary south of Smokey Mountain Smelters. The

sediment was moist, however, no water was found.



#### OFFICIAL PHOTOGRAPH NO. 5 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters **Date:** September 26, 2011

**Orientation:** East

**Photographer:** Janice Austin

**Subject:** Sample location SMSSWSD02 in the Unnamed Tributary south of Smokey Mountain Smelters. The

vegetation was high and evidence that water had recently flowed, however, no water was found for

purposes of sample collection.



# OFFICIAL PHOTOGRAPH NO. 6 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters **Date:** September 26, 2011

**Photo Number:** DSCI0109 Time: 1419

**Orientation:** East

**Photographer:** Janice Austin

**Subject:** Sample location SMSSWSD02 in the Unnamed Tributary south of Smokey Mountain Smelters. The

vegetation was high and evidence that water had recently flowed, however, no water was found for

purposes of sample collection.



#### OFFICIAL PHOTOGRAPH NO. 7 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters **Date:** September 26, 2011

**Photo Number:** DSCI0110 Time: 1423

**Orientation:** Southwest

**Photographer:** Linda Nyland

**Subject:** The drainage ditch on the western side of the Smokey Mountain Smelters site. No water was found in

the ditch, however, the soil was moist and vegetation thick.



# OFFICIAL PHOTOGRAPH NO. 8 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters **Date:** September 26, 2011

**Photo Number:** DSCI0111 Time: 1423

**Orientation:** Southwest

**Photographer:** Linda Nyland

**Subject:** The drainage ditch on the western side of the Smokey Mountain Smelters site. No water was found in

the ditch, however, the soil was moist and vegetation thick.



#### OFFICIAL PHOTOGRAPH NO. 9 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters **Date:** September 26, 2011

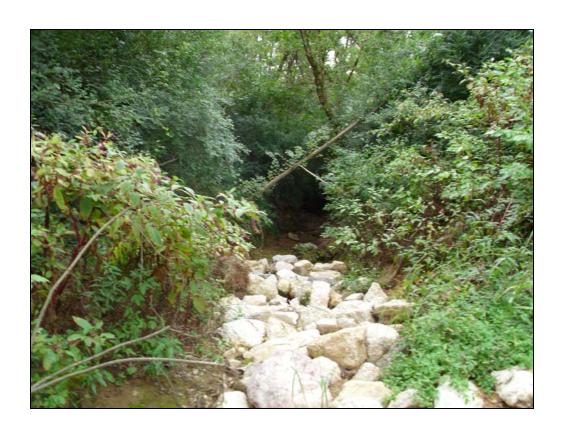
**Photo Number:** DSCI0112 Time: 1425

**Orientation:** South southeast

**Photographer:** Linda Nyland

**Subject:** The drainage ditch on the western side of the Smokey Mountain Smelters site. No water was found in

the ditch, however, the soil was moist and vegetation thick.



# OFFICIAL PHOTOGRAPH NO. 10 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters **Date:** September 26, 2011

**Orientation:** East

**Photographer:** Linda Nyland

**Subject:** The confluence of the eastern and western drainage ditches at the Smokey Mountain Smelters site.

Despite moist sediment, no pooling water was found in this area.



# OFFICIAL PHOTOGRAPH NO. 11 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters **Date:** September 28, 2011

**Photo Number:** DSCI0114 Time: 0945

**Orientation:** NA

**Photographer:** Linda Nyland

**Subject:** Debris and a snapping turtle in Flenniken Branch at sample location SMSSWSD11.



# OFFICIAL PHOTOGRAPH NO. 12 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters **Date:** September 28, 2011

**Photo Number:** DSCI0115 Time: 0945

**Orientation:** NA

**Photographer:** Linda Nyland

**Subject:** Debris and a snapping turtle (above the red rug) in Flenniken Branch at sample location

SMSSWSD11.



# OFFICIAL PHOTOGRAPH NO. 13 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters **Date:** September 28, 2011

**Photo Number:** DSCI0116 Time: 0959

**Orientation:** NA

**Photographer:** Linda Nyland

**Subject:** Larry Everett, Tennessee Department of Environment and Conservation (TDEC) and Tod DeLong,

Avatar Environmental (Avatar) conducts a macroinvertebrate survey at sample location SMSSWSD11

in Flenniken Branch.



# OFFICIAL PHOTOGRAPH NO. 14 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters **Date:** September 28, 2011

**Photo Number:** DSCI0117 Time: 0959

**Orientation:** NA

**Photographer:** Linda Nyland

**Subject:** Larry Every, TDEC and Tod DeLong, Avatar using the kickscreen prior to sample collection for

macroinvertebrate survey at sample location SMSSWSD11 in Flenniken Branch.



# OFFICIAL PHOTOGRAPH NO. 15 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters **Date:** September 28, 2011

**Photo Number:** DSCI0118 Time: 0959

**Orientation:** NA

**Photographer:** Linda Nyland

Subject: Larry Everett, TDEC and Tod DeLong, Avatar using the kickscreen prior to sample collection for

macroinvertebrate survey at sample location SMSSWSD11 in Flenniken Branch, Kristina Early,

Avatar, records water quality readings.



# OFFICIAL PHOTOGRAPH NO. 16 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters **Date:** September 28, 2011

**Photo Number:** DSCI0119 Time: 1000

**Orientation:** NA

**Photographer:** Linda Nyland

**Subject:** Larry Everett, TDEC and Tod DeLong, Avatar conducting macroinvertebrate survey at sample

location SMSSWSD11 in Flenniken Branch.



# OFFICIAL PHOTOGRAPH NO. 17 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters **Date:** September 28, 2011

**Orientation:** NA

**Photographer:** Linda Nyland

**Subject:** Tod DeLong, Avatar collects macroinvertebrate samples from kickscreen during macroinvertebrate

survey at sample location SMSSWSD11 in Flenniken Branch.



## OFFICIAL PHOTOGRAPH NO. 18 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters **Date:** September 28, 2011

**Photo Number:** DSCI0121 Time: 1003

**Orientation:** NA

**Photographer:** Linda Nyland

**Everett** 

**Subject:** Tod DeLong, Avatar collects macroinvertebrate samples from kickscreen during macroinvertebrate

survey at sample location SMSSWSD11 in Flenniken Branch, while Larry Everett, TDEC, and

Kristina Early, Avatar, collect water quality readings.

## J.M. Waller Associates, Inc. Remedial Action Contract II Lite, Region IV, Photo Log

Contract: Task No.:	EP-S4-08-03 019	Site Name: Date:	Smokey Mountain Jan 2012	n Smelters	
RPM:	Rusty Kestle	Project Mgt.:	Janice Austin		
		PHOT	O LOG		
		ACKNOWLE	EDGEMENTS		
SIGNATURE	Date:		PM SIGNATURE	Date:	



## OFFICIAL PHOTOGRAPH NO.: 1 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Cap **Date:** Jan 17, 2012

Photo Number: 1 Time: 1120

**Orientation:** North

**Photographer:** C. Brandon Clowers, TetraTech

**Subject:** Electroresistivity Imaging (ERI) testing equipment ready at ERI-1.



## OFFICIAL PHOTOGRAPH NO.: 2 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Smokey Mountain Smelters Cap Date: Jan 17, 2012

Photo Number: 2 Time: 1135

Orientation: Facing North

Photographer: C. Brandon Clowers, TetraTech

**Subject:** ERI-1 profile view from southwest end toward northeast. This profile line is approximately 900 feet

long.



## OFFICIAL PHOTOGRAPH NO.: 3 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Smokey Mountain Smelters Cap Date: Jan 17, 2012

Photo Number: 3 Time: 1400

Orientation: North

Photographer: C. Brandon Clowers, TetraTech

**Subject:** ERI-2 profile at south end looking north. This profile line is also approximately 900feet long.



## OFFICIAL PHOTOGRAPH NO.: 4 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Smokey Mountain Smelters Cap Date: Jan 17, 2012

Photo Number: 4 Time: 1545

Orientation: North

Photographer: C. Brandon Clowers, TetraTech

**Subject:** ERI-3 profile view east looking toward west southwest.



## OFFICIAL PHOTOGRAPH NO.: 5 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Smokey Mountain Smelters Cap Date: Jan 18, 2012

Photo Number: 5 Time: 1120

Orientation: North

Photographer: C. Brandon Clowers, TetraTech

**Subject:** ERI-4 profile view north looking toward south.



## OFFICIAL PHOTOGRAPH NO.: 6 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Smokey Mountain Smelters Cap Date: Jan 18, 2012

Photo Number: 6 Time: 1500

Orientation: North

Photographer: C. Brandon Clowers, TetraTech

**Subject:** ERI-5 View toward southeast end of 900 foot profile line.



## OFFICIAL PHOTOGRAPH NO.: 7 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Smokey Mountain Smelters Cap Date: Jan 18, 2012

Photo Number: 7 Time: 0955

Orientation: North

Photographer: C. Brandon Clowers, TetraTech

**Subject:** Set up for Seismic tomography at Seismic-1profile.



# OFFICIAL PHOTOGRAPH NO. 8 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Smokey Mountain Smelters Cap Date: Jan 18, 2012

Photo Number: 8 Time: 1010

Orientation: North

Photographer: C. Brandon Clowers, TetraTech

**Subject:** Seismic-1 profile south end looking toward north.



## OFFICIAL PHOTOGRAPH NO. 9 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Smokey Mountain Smelters Cap Date: Jan 18, 2012

Photo Number: 9 Time: 1200

Orientation: South

Photographer: C. Brandon Clowers, TetraTech

**Subject:** Seismic-2 profile view from northwest end to southeast end at south section of SMS.



## OFFICIAL PHOTOGRAPH NO. 10 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Smokey Mountain Smelters Cap Date: Jan 18, 2012

Photo Number: 10 Time: 1345

Orientation: South

Photographer: C. Brandon Clowers, TetraTech

**Subject:** Seismic-3 profile view from northwest end to southeast end at south section of SMS just north and

parallel of Seismic-2.



## OFFICIAL PHOTOGRAPH NO. 11 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Smokey Mountain Smelters Cap Date: Jan 18, 2012

Photo Number: 11 Time: 1345

Orientation: South

Photographer: C. Brandon Clowers, TetraTech

**Subject:** Seismic-4 profile view from northwest end to southeast end at south section of SMS just north and

parallel of Seismic-3.



## OFFICIAL PHOTOGRAPH NO. 12 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Smokey Mountain Smelters Cap Date: Jan 19, 2012

Photo Number: 12 Time: 0910

Orientation: South

Photographer: C. Brandon Clowers, TetraTech

**Subject:** Seismic-5 profile view from northwest end to southeast end at south section of SMS just north and

parallel of Seismic-4.



## OFFICIAL PHOTOGRAPH NO. 13 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Smokey Mountain Smelters Cap Date: Jan 19, 2012

Photo Number: 13 Time: 1100

Orientation: South

Photographer: C. Brandon Clowers, TetraTech

**Subject:** Seismic-6 profile view from southwest end to northeast end at south section of SMS.



## OFFICIAL PHOTOGRAPH NO. 14 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Smokey Mountain Smelters Cap Date: Jan 19, 2012

Photo Number: 14 Time: 1200

Orientation: South

Photographer: C. Brandon Clowers, TetraTech

**Subject:** Seismic-7 profile view from northwest end to southeast end at south section of SMS just north of

Seismic-6.



## OFFICIAL PHOTOGRAPH NO. 15 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Smokey Mountain Smelters Cap Date: Jan 19, 2012

Photo Number: 15 Time: 1230

Orientation: South

Photographer: C. Brandon Clowers, TetraTech

**Subject:** Seismic-8 profile view from southwest end to northeast end at center section and perpendicular to

Seismic-3, Seismic-4.



## OFFICIAL PHOTOGRAPH NO. 16 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Smokey Mountain Smelters Cap Date: Jan 19, 2012

Photo Number: 16 Time: 1440

Orientation: South

Photographer: C. Brandon Clowers, TetraTech

**Subject:** Seismic-9 profile view from southwest end to northeast end at center section of SMS just north and

perpendicular of Seismic-5.



# OFFICIAL PHOTOGRAPH NO. 17 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Smokey Mountain Smelters Cap Date: Jan 19, 2012

Photo Number: 17 Time: 1610

Orientation: South

Photographer: C. Brandon Clowers, TetraTech

**Subject:** Seismic-10 profile view from southwest end to northeast end at northeastern quadrant of SMS.



## OFFICIAL PHOTOGRAPH NO. 18 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Smokey Mountain Smelters Cap Date: Jan 19, 2012

Photo Number: 18 Time: 1615

Orientation: South

Photographer: C. Brandon Clowers, TetraTech

**Subject:** View of sledge hammer used for Seismic testing.



## OFFICIAL PHOTOGRAPH NO. 19 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Smokey Mountain Smelters Cap Date: Jan 19, 2012

Photo Number: 19 Time: 1625

Orientation: South

Photographer: C. Brandon Clowers, TetraTech

**Subject:** Use of the sledge hammer on metal plate to provide Seismic energy source.



# OFFICIAL PHOTOGRAPH NO. 20 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: Smokey Mountain Smelters Cap Date: Jan 19, 2012

Photo Number: 20 Time: 1110

Orientation: South

Photographer: C. Brandon Clowers, TetraTech

**Subject:** Total Station surveying of ERI Profile.

## J.M. Waller Associates, Inc. Remedial Action Contract II Lite, Region IV, Photo Log

SIGNATURE

Date:

Contract:	EP-S4-08-03	Site Name:	Smokey Mountain Smelters	
Task No.:	019 Busty Kastla	Date:	April 2012	
RPM:	Rusty Kestle	Project Mgt.:	Janice Austin	
		РНОТО	LOG	
Sediment sam	pling conducted on A	april 16 and 17, 2012 by	y J.M. Waller Associates, Inc. at historical samp	le
ocations for p	urposes of toxicity te	sting.		
		ACKNOWLED	CEMENTS	
		ACKNOWLED	GENIEN 13	

PM SIGNATURE

Date:



## OFFICIAL PHOTOGRAPH NO. 1 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSD03 **Date:** April 16, 2012

**Orientation:** East Northeast

**Photographer:** Linda Nyland

Subject: C.J. Roebuck of J.M. Waller Associates, Inc., (J.M. Waller) collecting a GPS location point after the

collection of sediment sample SMSSD03 on Flenniken Branch. This location is west of Smokey

Mountain Smelter Site.



## OFFICIAL PHOTOGRAPH NO. 2 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSD08 **Date:** April 16, 2012

Photo Number: DSCN0437 Time: 1805

**Orientation:** Northeast

**Photographer:** C.J. Roebuck

Subject: Culvert located near sediment sample location SMSSD08, on Flenniken Branch. This location is west

of Witherspoon Dump.



## OFFICIAL PHOTOGRAPH NO. 3 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSD08 **Date:** April 16, 2012

Photo Number: DSCN0438 Time: 1806

**Orientation:** Southeast

**Photographer:** C.J. Roebuck

**Subject:** Secondary culvert near sampling location SMSSD08.



## OFFICIAL PHOTOGRAPH NO. 4 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: SMSSD11 Date: April 17, 2012

Photo Number: DSCN0439 Time: 1454

**Orientation:** South

**Photographer:** Linda Nyland

**Subject:** C.J. Roebuck (J.M. Waller) rinsing sampling equipment after collecting the background sediment

sample at SMSSD11.



## OFFICIAL PHOTOGRAPH NO. 5 U.S. ENVIRONMENTAL PROTECTION AGENCY

Location: SMSSD11 Date: April 17, 2012

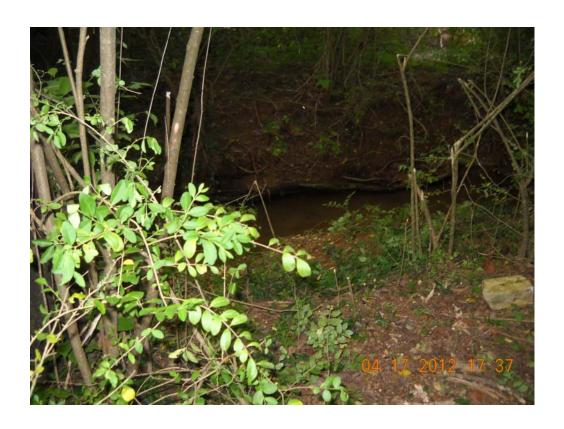
Photo Number: DSCN0440 Time: 1455

**Orientation:** Southeast

**Photographer:** Linda Nyland

Subject: C.J. Roebuck (J.M. Waller) packing the cooler with sediment samples after collection at background

location SMSSD11.



## OFFICIAL PHOTOGRAPH NO. 6 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSD04 **Date:** April 17, 2012

Photo Number: DSCN0444 Time: 1837

**Orientation:** South Southeast

**Photographer:** Linda Nyland

**Subject:** The west bank of Flenniken branch near the location where sediment sample SMSSD04 was collected.



## OFFICIAL PHOTOGRAPH NO. 7 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSD04 **Date:** April 17, 2012

**Orientation:** Northeast

**Photographer:** Linda Nyland

**Subject:** Sediment sample location SMSSD04, located on Flenniken Branch, southwest of the Smokey

Mountain Smelter Site. Photograph was taken after sample collection. Note in the middle ground of

the image, a discarded rug is laying in the creek.



## OFFICIAL PHOTOGRAPH NO. 8 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSD11 **Date:** May 8, 2012

**Photo Number:** IMAG1210 Time: 1326

**Orientation:** East

**Photographer:** Linda Nyland

**Subject:** Terence Chuhay (J. M. Waller) prior to collection of the background sediment sample at SMSSD11.

This is a re-sample at this location after the samples collected on 4/17/2012 were lost in shipping and

arrived at the lab exceeding the temperature requirements.



## OFFICIAL PHOTOGRAPH NO. 8 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** SMSSD11 **Date:** May 8, 2012

**Photo Number:** IMAG1211 Time: 1326

**Orientation:** East

**Photographer:** Linda Nyland

**Subject:** Terence Chuhay (J. M. Waller) collecting the background sediment sample at SMSSD11. This is a

re-sample at this location after the samples collected on 4/17/2012 were lost in shipping and arrived at

the lab exceeding the temperature requirements.

J.M. Waller Associates, Inc. Remedial Action Contract II Lite, Region IV, Photographic Log

Official Photograph No. 1

**Smokey Mountain Smelter Site** Knoxville, Knox County, Tennessee

Boring	MW-01	Split	5-7 ft.	Depth	6.2-7 ft.
No:		Spoon:		Interval	
				in Photo:	
Image	MW-01_5	5-7_ft(1).JP	G	Date:	5/16/2012
No:					
Photogra	<b>pher:</b> Janna	Peevler-Bo	Time:	NA	
Tech, Inc.					
Subject: Split spoon soil core sampled during the installation of					
groundwater monitoring well MW-01A via hollow stem auger drilli				auger drillin	

techniques. Lithologic description: clay, red (2.4 YR 4/6), stiff, slightly plastic, moist.



Boring No:	MW-01	Split Spoon:	10-12 ft.	Depth Interval in Photo:	10.0-10.5 ft.
Image No:	MW-01_10-12_ft(1).JPG			Date:	5/16/2012
	pher: Janna Peevler-Boyd, Tetra			Time:	NA

Subject: Split spoon soil core sampled during the installation of groundwater monitoring well MW-01A via hollow stem auger drilling techniques. Lithologic description: waste (Anthropogenic fill), black organic material.

Official Photograph No. 3
COLLEGE STATES
▶ 4 007 5 6 7 8 9 1 FT 1 2 3
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Boring	MW-01	Split	10-12	Depth	10.3-11.3 ft
No:		Spoon:	ft.	Interval	
				in Photo:	
Image	MW-01 10-12 ft(2).JPG			Date:	5/16/2012
No:					
Photogra	pher: Janna Peevler-Boyd, Tetra			Time:	NA
Tech, Inc.					

Subject: Split spoon soil core sampled during the installation of groundwater monitoring well MW-01A via hollow stem auger drilling techniques. Lithologic description: clay, strong brown (7.5YR 5/8), very stiff, slightly plastic, moist.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

		Official	Photog	raph No.	4		
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Smokey Mountain Smelter Site Knoxville, Knox County, Tennessee

Boring	MW-01	Split	10-12	Depth	11.3-12 ft.
No:		Spoon:	ft.	Interval	
				in Photo:	
Image	MW-01_10-12_ft(3).JPG			Date:	5/16/2012
No:					
Photogra	oher: Janna Peevler-Boyd, Tetra			Time:	NA
Tech, Inc.	c.				

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-01A via hollow stem auger drilling techniques. Lithologic description: clay, strong brown (7.5YR 5/8), very stiff, slightly plastic, moist.



Boring	MW-01	Split	15-17	Depth	15-15.7 ft
No:		Spoon:	ft.	Interval	
				in Photo:	
Image	MW-01 15-17 ft(1).JPG			Date:	5/16/2012
No:					
Photogra	pher: Janna Peevler-Boyd, Tetra			Time:	NA
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-01A via hollow stem auger drilling techniques. Lithologic description: clay, mottled brown (7.5 YR 5/8) and dark brown (7.5 YR 3/3), very stiff, slightly plastic, moist, minor chert fragments.

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Boring	MW-01	Split	15-17	Depth	15.7-16.5 ft
No:		Spoon:	ft.	Interval	
				in Photo:	
Image	MW-01 15-17 ft(2).JPG			Date:	5/16/2012
No:					
Photogra	pher: Janna Peevler-Boyd, Tetra			Time:	XXXX
Tech, Inc.	Tech, Inc.				

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-01A via hollow stem auger drilling techniques. Lithologic description: clay, mottled brown (7.5 YR 5/8) and dark brown (7.5 YR 3/3), very stiff, slightly plastic, moist, minor chert fragments.

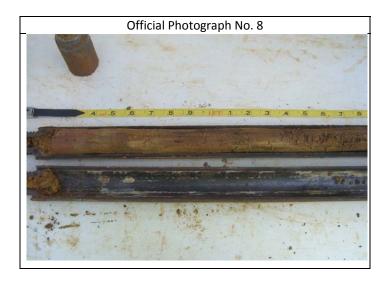
J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

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Smokey Mountain Smelter Site Knoxville, Knox County, Tennessee

Boring	MW-01	Split	15-17 ft	Depth	16.5-17 ft
No:		Spoon:		Interval	
				in Photo:	
Image	MW-01_15-17_ft(3).JPG			Date:	5/16/2012
No:	2				
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-01A via hollow stem auger drilling techniques. Lithologic description: clay, mottled brown (7.5 YR 5/8) and dark brown (7.5 YR 3/3), very stiff, slightly plastic, moist, minor chert fragments.



Boring No:	MW-01	Split Spoon:	20-22 ft.	Depth Interval in Photo:	20-21.8 ft
Image No:	MW-01_20-22_ft(1).JPG			Date:	5/16/2012
Photographer: Janna Peevler-Boyd, Tetra Tech, Inc.				Time:	NA

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-01A via hollow stem auger drilling techniques. Lithologic description: clay, mottled strong brown (7.5 YR 5/8) and dark brown (7.5 YR 3/3), stiff, slightly plastic, very moist, minor chert fragments.

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Boring No:	MW-01	Split Spoon:	20-22 ft.	Depth Interval in Photo:	21.4-22 ft
Image No:	MW-01_20-22_ft(2).JPG			Date:	5/16/2012
Photographer: Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	XXXX	

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-01A via hollow stem auger drilling techniques. Lithologic description: clay, mottled strong brown (7.5 YR 5/8) and dark brown (7.5 YR 3/3), stiff, slightly plastic, very moist, minor chert fragments.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

Official Photograph No. 10
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Smokey Mountain Smelter Site
Knoxville, Knox County, Tennessee

Boring	MW-01	Split	25-27 ft	Depth	25.4-26.5 ft
No:		Spoon:		Interval	
				in Photo:	
Image	MW-01_25-27_ft(2).JPG			Date:	5/16/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-01A via hollow stem auger drilling techniques. Lithologic description: silty clay, strong brown (7.5 YR 5/8) mottled (15%) with dark brown (7.5 YR 3/3), very stiff, friable, dry & crumbly, laminated fabric.

	Official Photo	graph No. 11	
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Boring No:	MW-01	Split Spoon:	25-27 ft	Depth Interval in Photo:	26.1-27 ft
Image No:	MW-01_25-27_ft(3).JPG			Date:	5/16/2012
Photographer: Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	NA	

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-01A via hollow stem auger drilling techniques. Lithologic description: silty clay, strong brown (7.5 YR 5/8) mottled (15%) with dark brown (7.5 YR 3/3), very stiff, friable, dry & crumbly, laminated fabric.

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Boring No:	MW-01	Split Spoon:	30-32 ft	Depth Interval in Photo:	30-30.8 ft
Image	MW-01_30-32_ft(1).JPG			Date:	5/16/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	XXXX	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-01A via hollow stem auger drilling techniques. Lithologic description: silty clay, mottled yellow (10 YR 5/8) and dark yellow brown (10 YR 4/4), soft, plastic, moist, minor gravel.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

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Boring	MW-01	Split	30-32 ft	Depth	30.5-31.5 ft
No:		Spoon:		Interval	
				in Photo:	
Image	MW-01_30-32_ft(2).JPG		Date:	5/16/2012	
No:					
Photogra	<b>oher:</b> Janna Peevler-Boyd, Tetra			Time:	NA
Tech, Inc.	<u>.</u>				

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-01A via hollow stem auger drilling techniques. Lithologic description: silty clay, mottled yellow brown (10 YR 5/8) and dark yellow brown (10 YR 4/4), soft, plastic, moist, minor gravel.



Boring No:	MW-01	Split Spoon:	30-32 ft	Depth Interval in Photo:	31.4-32 ft
Image No:	MW-01_30-32_ft(3).JPG			Date:	5/16/2012
<b>Photographer:</b> Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	NA	

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-01A via hollow stem auger drilling techniques. Lithologic description: silty clay, mottled yellow brown (10 YR 5/8) and dark yellow brown (10 YR 4/4), soft, plastic, moist, minor gravel.

Official Photograph No. 15	
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Boring No:	MW-01	Split Spoon:	35-37 ft	Depth Interval in Photo:	35-36.2 ft
Image No:	MW-01_35-37_ft(1).JPG			Date:	5/16/2012
<b>Photographer:</b> Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	XXXX	

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-01A via hollow stem auger drilling techniques. Lithologic description: silty clay, yellow brown (10 YR 5/8), soft, plastic, very moist.

J.M. Waller Associates, Inc. Remedial Action Contract II Lite, Region IV, Photographic Log

Off	icial Photogr	aph No. 1	16	
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Boring	MW-01	Split	35-37 ft	Depth	35.6-36.8 ft
No:		Spoon:		Interval	
				in Photo:	
Image	MW-01_35-37_ft(2).JPG			Date:	5/16/2012
No:					
Photogra	pher: Janna Peevler-Boyd, Tetra			Time:	NA
Tech, Inc.	ech, Inc.				

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-01A via hollow stem auger drilling techniques. Lithologic description: silty clay, yellow brown (10 YR 5/8), soft, plastic, very moist.



Boring No:	MW-01	Split Spoon:	35-37 ft	Depth Interval in Photo:	36.3-37 ft
Image	MW-01_35-37_ft(3).JPG			Date:	5/16/2012
No:					
Photogra	pher: Janna Peevler-Boyd, Tetra			Time:	NA
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-01A via hollow stem auger drilling techniques. Lithologic description: silty clay, yellow brown (10 YR 5/8), soft, plastic, very moist.

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Boring No:	MW-01	Split Spoon:	40-42 ft	Depth Interval in Photo:	40-41 ft
Image No:	MW-01_40-42_ft(1).JPG			Date:	5/16/2012
<b>Photographer:</b> Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	XXXX	

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-01A via hollow stem auger drilling techniques. Lithologic description: silty clay, yellow brown (10 YR 5/8), very soft, plastic, very moist to wet, minor dolomitic gravel.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

Smokey Wountain Smeller Site					
		K	noxville, K	nox County	, Tennessee
Boring	MW-01	Split	40-42 ft	Depth	40.6-41.6 ft
No:		Spoon:			
				in Photo:	
Image	MW-01_40-42_ft(2).JPG			Date:	5/16/2012
No:					
Photograp	<b>pher:</b> Janna	her: Janna Peevler-Boyd, Tetra			NA
Tech, Inc.					
Subject: Split spoon soil core sampled during the installation of					
groundwater menitoring well NAM O1A via hellow stem auger drilling					

Official Photograph No. 19
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**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-01A via hollow stem auger drilling techniques. Lithologic description: silty clay, yellow brown (10 YR 5/8), very soft, plastic, very moist to wet, minor dolomitic gravel.

**Smokey Mountain Smelter Site** 



Boring No:	MW-01	Split Spoon:	40-42 ft	Depth Interval in Photo:	41.4-42 ft
Image No:	MW-01_40-42_ft(3).JPG			Date:	5/16/2012
Photographer: Janna Peevler-Boyd, Tetra Tech, Inc.				Time:	NA

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-01A via hollow stem auger drilling techniques. Lithologic description: silty clay, yellow brown (10 YR 5/8), very soft, plastic, very moist to wet, minor dolomitic gravel.

	Official Photograph	n No. 21
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Boring No:	MW-01	Split Spoon:	45-47 ft	Depth Interval in Photo:	45.5-46.5 ft
Image No:	MW-01_45-47_ft(2).JPG			Date:	5/16/2012
Photographer: Janna Peevler-Boyd, Tetra Tech, Inc.				Time:	XXXX

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-01A via hollow stem auger drilling techniques. Lithologic description: silty clay, yellow brown (10 YR 5/8), very soft, plastic, very moist to wet, minor dolomitic gravel.

J.M. Waller Associates, Inc. Remedial Action Contract II Lite, Region IV, Photographic Log

Official Photograph No. 22
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Boring No:	MW-01	Split Spoon:	45-47 ft	Depth Interval in Photo:	46-47 ft
Image	MW-01_45-47_ft(3).JPG			Date:	5/16/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-01A via hollow stem auger drilling techniques. Lithologic description: silty clay, yellow brown (10 YR 5/8), very soft, plastic, very moist to wet, minor dolomitic gravel. Refusal, end of boring at 46 feet below land surface.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

Official Photograph No	. 23
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Boring	MW-02	Split	5-7 ft	Depth	5-6.9 ft
No:		Spoon:		Interval	
				in Photo:	
Image	MW-02_5-7_ft(1).JPG			Date:	5/15/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra				Time:	NA
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-02A via hollow stem auger drilling techniques. Lithologic description: SILTY CLAY, red-brown (2.5YR 4/3), very soft, moist, wood debris, creosote odor.



Boring No:	MW-02	Split Spoon:	5-7 ft	Depth Interval in Photo:	5.7-7 ft
Image No:	MW-02_5-7_ft(2).JPG			Date:	5/15/2012
<b>Photographer:</b> Janna Peevler-Boyd, Tetra Tech, Inc.				Time:	NA

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-02A via hollow stem auger drilling techniques. Lithologic description: SILTY CLAY, red-brown (2.5YR 4/3), very soft, moist, wood debris, creosote odor. (Lower 0.4 inches WASTE (Anthropogenic fill), black, sandy granular material.

Official Photograph No. 25
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ime:	XXXX
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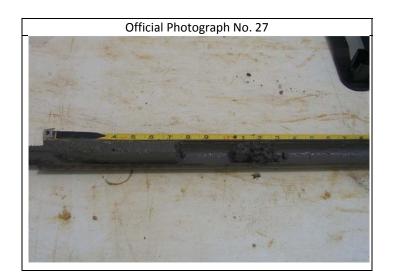
**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-02A via hollow stem auger drilling techniques. Lithologic description: CLAY, dark red-brown (2.5YR 5/8), stiff, moist and WASTE (Anthropogenic fill), blue-black (10G 2.5/1), grainular, wet, wood fragments, strong ammonia odor, NH3 >200 ppm.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

Official Photogra	iph No. 26
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Boring	MW-02	Split	10-12 ft	Depth	11.2-12 ft
No:		Spoon:		Interval	
				in Photo:	
Image	MW-02_10-12_ft(2).JPG			Date:	5/15/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra				Time:	NA
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-02A via hollow stem auger drilling techniques. Lithologic description: WASTE (Anthropogenic fill), blueblack (10G 2.5/1), granular, wet, wood fragments, strong ammonia odor.



Boring No:	MW-02	Split Spoon:	15-17 ft	Depth Interval in Photo:	15-16.8 ft
Image No:	MW-02_15-17_ft(2).JPG			Date:	5/15/2012
Photographer: Janna Peevler-Boyd, Tetra Tech, Inc.				Time:	NA

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-02A ia hollow stem auger drilling techniques. Lithologic description: WASTE (Anthropogenic fill), blueblack (10G 2.5/1), granular, wet, wood fragments, strong ammonia odor.



MW-02	Split	20-22 ft	Depth	21-22 ft
	Spoon:		Interval	
			in Photo:	
MW-02 20-22 ft(2).JPG			Date:	5/15/2012
,				
Photographer: Janna Peevler-Boyd, Tetra			Time:	XXXX
Tech, Inc.				
	MW-02_2	Spoon: MW-02_20-22_ft(2).	Spoon: MW-02_20-22_ft(2).JPG	Spoon: Interval in Photo:  MW-02_20-22_ft(2).JPG Date:

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-02A via hollow stem auger drilling techniques. Lithologic description: WASTE (Anthropogenic fill), blueblack (10G 2.5/1), granular, wet, wood fragments, strong ammonia odor.

J.M. Waller Associates, Inc. Remedial Action Contract II Lite, Region IV, Photographic Log

	Official Photograph No. 29	
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Boring	MW-02	Split	28-30 ft	Depth	28-30 ft
No:		Spoon:		Interval	
				in Photo:	
Image	MW-02_28-30_ft(1).JPG			Date:	5/15/2012
No:					
Photogra	grapher: Janna Peevler-Boyd, Tetra			Time:	NA
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-02A via hollow stem auger drilling techniques. Lithologic description CLAY, strong brown (7.5YR 5/8), very stiff, dry.



MW-02	Split	28-30 ft	Depth	29.2-30 ft
	Spoon:		Interval	
			in Photo:	
MW-02 28-30 ft(2).JPG			Date:	5/15/2012
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA
Tech, Inc.				
	MW-02_2	Spoon: MW-02_28-30_ft(2).	Spoon: MW-02_28-30_ft(2).JPG	Spoon: Interval in Photo:  MW-02_28-30_ft(2).JPG Date:

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-02A via hollow stem auger drilling techniques. Lithologic description CLAY, strong brown (7.5YR 5/8), very stiff, dry.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

	Smokey Mountain Smercer Site						
		Knoxville, Knox County, Tennessee					
Boring	MW-	Split	5-7 ft	Depth	6-7 ft		
No:	03(2)	Spoon:		Interval			
				in Photo:			
Image	MW-03(2)_5-7_ft.JPG			Date:	5/29/2012		
No:							
Photographer: Janna Peevler-Boyd, Tetra				Time:	NA		
Tech, Inc.							
Subject: Split spoon soil core sampled during the installation of							
l							

Official	Photog	graph No	o. 31		
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**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: CLAY, yellow-red (5YR 5/8) mottled (25%) with yellow (10YR 7/8), very stiff, damp.

**Smokey Mountain Smelter Site** 



Boring No:	MW- 03(2)	Split Spoon:	7-9 ft	Depth Interval in Photo:	8-9 ft
Image No:	MW-03(2)_7-9_ft(1).JPG			Date:	5/29/2012
<b>Photographer:</b> Janna Peevler-Boyd, Tetra Tech, Inc.				Time:	NA

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: CLAY, yellow-red (5YR 5/8) mottled (25%) with yellow (10YR 7/8), very stiff, damp.

Off	icial Photograph No	0. 33
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Boring No:	MW- 03(2)	Split Spoon:	9-11 ft	Depth Interval in Photo:	9-10.3 ft
Image	MW-03(2)_9-11_ft(1).JPG			Date:	5/29/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: WASTE (Anthropogenic Fill), with soft moist grey (G1 6/1) CLAY, with plastic and light grey rock fragments

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

Official Photograph No. 34
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Boring	MW-	Split	9-11 ft	Depth	10-11 ft
No:	03(2)	Spoon:		Interval	
				in Photo:	
Image	MW-03(2)_9-11_ft(2).JPG			Date:	5/29/2012
No:					
Photogra	rapher: Janna Peevler-Boyd, Tetra			Time:	NA
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: WASTE (Anthropogenic Fill), with soft moist grey (G1 6/1) CLAY, with plastic and light grey rock fragments.

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Boring No:	MW- 03(2)	Split Spoon:	11-13 ft	Depth Interval in Photo:	11-12 ft
Image No:	MW-03(2)_11-13_ft(1).JPG			Date:	5/29/2012
Photographer: Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	NA	

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: WASTE (Anthropogenic Fill), black granular material, rubber, and wood.

	Official Photograph No. 36
.2 3	.4 .5 .6 7 .8 .9 2FT .1 .2

Boring No:	MW- 03(2)	Split Spoon:	11-13 ft	Depth Interval in Photo:	12.2-13 ft
Image No:	MW-03(2)_11-13_ft(2).JPG			Date:	5/29/2012
Photographer: Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	NA	

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: WASTE (Anthropogenic Fill), black granular material, rubber, and wood.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

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Boring	MW-	Split	13-15 ft	Depth	14.5-15 ft
No:	03(2)	Spoon:		Interval	
				in Photo:	
Image	MW-03(2)_13-15_ft.JPG			Date:	5/29/2012
No:	_				
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.	• .				

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: WASTE (Anthropogenic Fill), rubber, and wood.



Boring No:	MW- 03(2)	Split Spoon:	15-17 ft	Depth Interval in Photo:	15-16 ft
Image No:	MW-03(2)_15-17_ft(1).JPG			Date:	5/29/2012
Photograp Tech, Inc.	Photographer: Janna Peevler-Boyd, Tetra			Time:	NA

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: CLAY, strong brown (7.5YR 5/6), stiff, moist.

Official Photograph No. 39
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Boring No:	MW- 03(2)	Split Spoon:	15-17 ft	Depth Interval in Photo:	16-17 ft
Image	MW-03(2)_15-17_ft(2).JPG			Date:	5/29/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: CLAY, strong brown (7.5YR 5/6), stiff, moist.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

Official Photograph No. 40
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Boring	MW-	Split	19-21 ft	Depth	19-20 ft
No:	03(2)	Spoon:		Interval	
				in Photo:	
Image	MW-03(2)_19-21_ft(1).JPG			Date:	5/29/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.	• . , ,				

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: SILTY CLAY with SHALE, yellowbrown (10YR 5/6), stiff, dry, laminated fabric.



Boring No:	MW- 03(2)	Split Spoon:	19-21 ft	Depth Interval in Photo:	20-21 ft
Image No:	MW-03(2)_19-21_ft(2).JPG			Date:	5/29/2012
Photographer: Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	NA	

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: SILTY CLAY with SHALE, yellowbrown (10YR 5/6), stiff, dry, laminated fabric.

Official Photograph No. 42
7 7 3 4 5 6 7 3 9 2 1

Boring No:	MW- 03(2)	Split Spoon:	19-21 ft	Depth Interval in Photo:	25.1-26 ft
Image	MW-03(2)_24-26_ft(1).JPG			Date:	5/29/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra				Time:	NA
Tech, Inc.					

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

Official Photog	raph No. 43
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Boring	MW-	Split	34-38 ft	Depth	34-35 ft
No:	03(2)	Spoon:		Interval	
				in Photo:	
Image	MW-03(2)_34-38_ft(1).JPG			Date:	5/31/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: CLAY, yellow-brown (10YR 5/6) to dark yellow-brown (10YR 3/6), soft, moist, with weathered shale and dolomite.



Boring No:	MW- 03(2)	Split Spoon:	34-38 ft	Depth Interval in Photo:	35-36 ft
Image	MW-03(2)_34-38_ft(2).JPG			Date:	5/31/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra				Time:	NA
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: CLAY, yellow-brown (10YR 5/6) to dark yellow-brown (10YR 3/6), soft, moist, with weathered shale and dolomite.

Official Photograph No. 45	
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Boring	MW-	Split	34-38 ft	Depth	35.9- 36.5	
No:	03(2)	Spoon:		Interval	ft	
				in Photo:		
Image	MW-03(2) 34-38 ft(3).JPG			Date:	5/31/2012	
No:						
Photographer: Janna Peevler-Boyd, Tetra				Time:	NA	
Tech, Inc.						

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: CLAY, yellow-brown (10YR 5/6) to dark yellow-brown (10YR 3/6), soft, moist, with weathered shale and dolomite.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log



Tech, Inc.

**Smokey Mountain Smelter Site** 

Official Photograph No. 46

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: CLAY, yellow-brown (10YR 5/6) to dark yellow-brown (10YR 3/6), soft, moist, with weathered shale and dolomite.



Boring No:	MW- 03(2)	Split Spoon:	38-43 ft	Depth Interval in Photo:	39.6-40.3 ft
Image No:	MW-03(2)_38-43_ft(4).JPG			Date:	5/31/2012
Photographer: Janna Peevler-Boyd, Tetra Tech, Inc.				Time:	NA

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: CLAY, yellow-brown (10YR 5/6) to dark yellow-brown (10YR 3/6), soft, moist, with weathered shale and dolomite.

Official Photo	graph No. 48
	43'

	Split	38-43 ft	Depth	39.5-40.5 ft
3(2)	Spoon:		Interval	
			in Photo:	
MW-03(2) 38-43 ft(6).JPG			Date:	5/31/2012
Photographer: Janna Peevler-Boyd, Tetra				NA
Tech, Inc.				
١	W-03(2)	W-03(2)_38-43_ft(	W-03(2)_38-43_ft(6).JPG	in Photo: W-03(2)_38-43_ft(6).JPG

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: LIMESTONE, grey and white, crystalline, massive, dolomitic, interbedded with shale. Mud filled fractures.

J.M. Waller Associates, Inc. Remedial Action Contract II Lite, Region IV, Photographic Log

Knoxville, Knox County, Tennessee

Boring	MW-	Split	43-48 ft	Depth	43-44.8 ft
No:	03(2)	Spoon:		Interval	
				in Photo:	
Image	MW-03(2)_43-48_ft(1).JPG			Date:	5/31/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra				Time:	NA
Tech, Inc.					

**Smokey Mountain Smelter Site** 

Subject: Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: LIMESTONE, grey and white, crystalline, massive, dolomitic, interbedded with shale. Mud filled fractures.



Boring No:	MW- 03(2)	Split Spoon:	43-48 ft	Depth Interval in Photo:	43-43.8 ft
Image No:	MW-03(2)_43-48_ft(4).JPG			Date:	5/31/2012
Photographer: Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	NA	

Subject: Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: LIMESTONE, grey and white, crystalline, massive, dolomitic, interbedded with shale. Mud filled fractures.

Official Photograph No. 51
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MW-	Split	43-48 ft	Depth	44.5-45.5 ft
03(2)	Spoon:		Interval	
			in Photo:	
MW-03(2) 43-48 ft(3).JPG			Date:	5/31/2012
. , , ,				
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA
Tech, Inc.				
	03(2) MW-03(2)	03(2) Spoon: MW-03(2)_43-48_ft(	03(2) Spoon: MW-03(2)_43-48_ft(3).JPG	03(2)

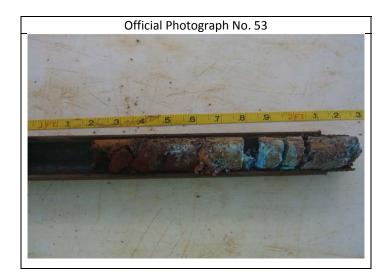
Subject: Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: LIMESTONE, grey and white, crystalline, massive, dolomitic, interbedded with shale. Mud filled fractures.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

Official Photograph No. 52	
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Boring	MW-	Split	5-7 ft	Depth	5-6.3 ft
No:	04(no	Spoon:		Interval	
	well)	-		in Photo:	
Image	MW-04(1)_5-7(1).JPG			Date:	5/21/2012
No:					
Photogra	otographer: Janna Peevler-Boyd, Tetra			Time:	NA
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: CLAY with chert, dark red-brown (5YR 3/4) mottled (10%) with yellow (10YR 7/8), very stiff, moist.



Boring No:	MW- 04(no well)	Split Spoon:	5-7 ft	Depth Interval in Photo:	6-7 ft
Image No:	MW-04(1)_5-7(2).JPG			Date:	5/21/2012
<b>Photographer:</b> Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	NA	

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: CLAY, pale green (10G 8/2), crumbly, granular.

	Official	Photogr	aph No. 5	4	
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MW-	Split	5-7 ft	Depth	6.4-7 ft
04(no	Spoon:		Interval	
well)			in Photo:	
MW-04(1) 5-7(3).JPG			Date:	5/21/2012
\				
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA
Tech, Inc.				
	04(no well) MW-04(1	04(no Spoon: well) MW-04(1)_5-7(3).JP0	04(no Spoon: well)  MW-04(1)_5-7(3).JPG	04(no spoon: Interval in Photo: MW-04(1)_5-7(3).JPG Date:

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-03B via hollow stem auger drilling techniques. Lithologic description: CLAY, pale green (10G 8/2), crumbly, granular.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

Of	ficial Photogra _l	ph No. 55	
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Boring	MW-	Split	5-7 ft	Depth	5-6.1 ft
No:	04(2)	Spoon:		Interval	
				in Photo:	
Image	MW-04(2)_5-7(1).JPG			Date:	5/21/2012
No:					
Photogra	pher: Janna Peevler-Boyd, Tetra			Time:	NA
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-04A via hollow stem auger drilling techniques. Lithologic description: CLAY, dark red-brown (5YR 3/4) mottled (25%) with yellow (2.5Y 7/8), very stiff, moist.



Boring No:	MW- 04(2)	Split Spoon:	5-7 ft	Depth Interval in Photo:	6.4-7 ft
Image No:	MW-04(2)_5-7(2).JPG			Date:	5/21/2012
<b>Photographer:</b> Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	NA	

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-04A via hollow stem auger drilling techniques. Lithologic description: CLAY, strong brown (7.5YR 5/8) mottled (25%) with dark brown (7.5Y 3/4), very stiff, moist.

Offici	al Photo	graph N	o. 57		
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Boring No:	MW- 04(2)	Split Spoon:	10-12 ft	Depth Interval in Photo:	10-10.9 ft
Image	MW-04(2)_10-12(1).JPG			Date:	5/21/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-04A via hollow stem auger drilling techniques. Lithologic description: CLAY, strong brown (7.5YR 5/8) mottled (25%) with dark brown (7.5Y 3/4), very stiff, moist.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

Official Photograph No. 58
.6 .7 .8 .9 1 FT 1 .2 .3 .4 .5
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Boring	MW-	Split	10-12 ft	Depth	10.6-11.5 ft
No:	04(2)	Spoon:		Interval	
				in Photo:	
Image	MW-04(2)_10-12(2).JPG			Date:	5/21/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-04A via hollow stem auger drilling techniques. Lithologic description: CLAY, strong brown (7.5YR 5/8) mottled (25%) with dark brown (7.5Y 3/4), very stiff, moist.

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Boring No:	MW- 04(2)	Split Spoon:	10-12 ft	Depth Interval in Photo:	10.8-11.5 ft
Image No:	MW-04(2)_10-12(4).JPG			Date:	5/21/2012
Photographer: Janna Peevler-Boyd, Tetra Tech, Inc.				Time:	NA

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-04A via hollow stem auger drilling techniques. Lithologic description: CLAY, strong brown (7.5YR 5/8) mottled (25%) with dark brown (7.5Y 3/4), very stiff, moist.

Official Photograph No. 60
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MW-	Split	10-12 ft	Depth	11.5-12 ft
04(2)	Spoon:		Interval	
			in Photo:	
MW-04(2) 10-12(3).JPG			Date:	5/21/2012
,				
Photographer: Janna Peevler-Boyd, Tetra				NA
	04(2) MW-04(2	04(2) Spoon: MW-04(2)_10-12(3).	04(2) Spoon: MW-04(2)_10-12(3).JPG	04(2)         Spoon:         Interval in Photo:           MW-04(2)_10-12(3).JPG         Date:

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-04A via hollow stem auger drilling techniques. Lithologic description: CLAY, strong brown (7.5YR 5/8) mottled (25%) with dark brown (7.5Y 3/4), very stiff, moist.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

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Boring	MW-	Split	15-17 ft	Depth	15-16.1 ft
No:	04(2)	Spoon:		Interval	
				in Photo:	
Image	MW-04(2)_15-17(1).JPG			Date:	5/21/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-04A via hollow stem auger drilling techniques. Lithologic description: CLAY, yellow brown (10YR 5/8) very stiff, dry & crumbly, laminated fabric.



Boring No:	MW- 04(2)	Split Spoon:	15-17 ft	Depth Interval in Photo:	16.1-17 ft
Image No:	MW-04(2)_15-17(2).JPG			Date:	5/21/2012
Photographer: Janna Peevler-Boyd, Tetra Tech, Inc.				Time:	NA

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-04A via hollow stem auger drilling techniques. Lithologic description: CLAY, yellow brown (10YR 5/8) very stiff, dry & crumbly, laminated fabric.

Official Photograph No. 63
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Boring No:	MW- 04(2)	Split Spoon:	17-19 ft	Depth Interval in Photo:	17-17.9 ft
Image	MW-04(2)_17-19(1).JPG			Date:	5/21/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

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Boring No:	MW- 04(2)	Split Spoon:	17-19 ft	Depth Interval in Photo:	17.8-18.8 ft
Image	MW-04(2)_17-19(2).JPG			Date:	5/21/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-04A via hollow stem auger drilling techniques. Lithologic description: CLAY, yellow brown (10YR 5/8) very stiff, dry & crumbly, laminated fabric.



Boring No:	MW- 04(2)	Split Spoon:	17-19 ft	Depth Interval in Photo:	18.3-19 ft
Image No:	MW-04(2)_17-19(3).JPG			Date:	5/21/2012
Photographer: Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	NA	

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-04A via hollow stem auger drilling techniques. Lithologic description: CLAY, yellow brown (10YR 5/8) very stiff, dry & crumbly, laminated fabric.

Official Photograph No. 66
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Boring No:	MW- 04(2)	Split Spoon:	19-21 ft	Depth Interval in Photo:	19-20.2 ft
Image	MW-04(2)_19-21(1).JPG			Date:	5/21/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

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Boring	MW-	Split	19-21 ft	Depth	20-21 ft
No:	04(2)	Spoon:		Interval	
				in Photo:	
Image	MW-04(2)_19-21(2).JPG			Date:	5/21/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-04A via hollow stem auger drilling techniques. Lithologic description: CLAY, yellow brown (10YR 5/8) very stiff, dry & crumbly, laminated fabric.



Boring No:	MW- 04(2)	Split Spoon:	21-23 ft	Depth Interval in Photo:	21-22 ft
Image No:	MW-04(2)_21-23(1).JPG			Date:	5/21/2012
Photographer: Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	NA	

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-04A via hollow stem auger drilling techniques. Lithologic description: CLAY, yellow brown (10YR 5/8) very stiff, dry & crumbly, laminated fabric.

Official Photo	Official Photograph No. 69					
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Boring No:	MW- 04(2)	Split Spoon:	21-23 ft	Depth Interval in Photo:	22.2-23 ft
Image	MW-04(2)_21-23(2).JPG			Date:	5/21/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

	Official Photogra	aph No. 70	
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Boring	MW-	Split	25-27 ft	Depth	25-26 ft
No:	04(2)	Spoon:		Interval	
				in Photo:	
Image	MW-04(2)_25-27(1).JPG			Date:	5/21/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.	Tech, Inc.				

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-04A via hollow stem auger drilling techniques. Lithologic description: CLAY, dark yellow-brown (10YR 4/6) mottled (25%) with black, very soft.



Boring No:	MW- 04(2)	Split Spoon:	25-27 ft	Depth Interval in Photo:	25.2-27 ft
Image No:	MW-04(2)_25-27(2).JPG			Date:	5/21/2012
<b>Photographer:</b> Janna Peevler-Boyd, Tetra Tech, Inc.				Time:	NA

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-04A via hollow stem auger drilling techniques. Lithologic description: CLAY, dark yellow-brown (10YR 4/6) mottled (25%) with black, very soft.

Official Photograph No.	72
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Boring No:	MW- 04(2)	Split Spoon:	25-27 ft	Depth Interval in Photo:	26-26.7 ft
Image	MW-04(2)_25-27(3).JPG			Date:	5/21/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-04A via hollow stem auger drilling techniques. Lithologic description: CLAY, dark yellow-brown (10YR 4/6) mottled (25%) with black, very soft.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

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Boring	MW-	Split	30-32 ft	Depth	30-31 ft
No:	04(2)	Spoon:		Interval	
				in Photo:	
Image	MW-04(2)_30-32(1).JPG			Date:	5/21/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-04A via hollow stem auger drilling techniques. Lithologic description: CLAY, yellow brown (10YR 5/8) very stiff, dry & crumbly, laminated fabric.



Boring No:	MW- 04(2)	Split Spoon:	30-32 ft	Depth Interval in Photo:	30.9-31.9 ft
Image No:	MW-04(2)_30-32(2).JPG			Date:	5/21/2012
<b>Photographer:</b> Janna Peevler-Boyd, Tetra Tech, Inc.				Time:	NA

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-04A via hollow stem auger drilling techniques. Lithologic description: CLAY, yellow brown (10YR 5/8) very stiff, dry & crumbly, laminated fabric.

Official Photograph No. 75
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Boring No:	MW- 04(2)	Split Spoon:	30-32 ft	Depth Interval in Photo:	31.2-32 ft
Image	MW-04(2)_30-32(3).JPG			Date:	5/21/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

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Boring	MW-	Split	35-37 ft	Depth	35-35.9 ft
No:	04(2)	Spoon:		Interval	
				in Photo:	
Image	MW-04(2)_35-37(1).JPG			Date:	5/21/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-04A via hollow stem auger drilling techniques. Lithologic description: CLAY with chert GRAVEL, yellow brown (10YR 5/8) very stiff, dry & crumbly, slightly plastic, laminated fabric.



Boring No:	MW- 04(2)	Split Spoon:	35-37 ft	Depth Interval in Photo:	35.7-36.5 ft
Image No:	MW-04(2)_35-37(2).JPG			Date:	5/21/2012
<b>Photographer:</b> Janna Peevler-Boyd, Tetra Tech, Inc.				Time:	NA

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-04A via hollow stem auger drilling techniques. Lithologic description: CLAY with chert GRAVEL, yellow brown (10YR 5/8) very stiff, dry & crumbly, slightly plastic, laminated fabric.

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Boring	MW-	Split	35-37 ft	Depth	36.3-37 ft
No:	04(2)	Spoon:		Interval	
				in Photo:	
Image	MW-04(2)_35-37(3).JPG		Date:	5/21/2012	
No:					
Photographer: Janna Peevler-Boyd, Tetra		Time:	NA		
Tech, Inc.	Inc.				
, , ,		Time:	NA		

J.M. Waller Associates, Inc. Remedial Action Contract II Lite, Region IV, Photographic Log



Boring No:	MW- 04(2)	Split Spoon:	40-42 ft	Depth Interval in Photo:	41-42 ft
Image	MW-04(2)_40-42(2).JPG		Date:	5/21/2012	
No:					
Photogra	apher: Janna Peevler-Boyd, Tetra		Time:	NA	
Tech, Inc.					

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

Official Photograph No. 80

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Smokey Mountain Smelter Site Knoxville, Knox County, Tennessee

Boring	MW-05	Split	5-7 ft	Depth	5-5.9 ft
No:		Spoon:		Interval	
				in Photo:	
Image	MW-05_5-7_ft(1).JPG		Date:	5/18/2012	
No:					
Photogra	pher: Janna Peevler-Boyd, Tetra		Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled via hollow stem auger drilling techniques. Lithologic description: CLAY, yellow-red (5YR 4/6) mottled (25%) with brown-yellow (10YR 6/8) stiff, dry and WASTE (Anthropogenic fill), black granular salt cake, NH3 =>200 ppm.



Boring No:	MW-05	Split Spoon:	5-7 ft	Depth Interval in Photo:	5.4-6.6 ft
Image No:	MW-05_5-7_ft(2).JPG			Date:	5/18/2012
<b>Photographer:</b> Janna Peevler-Boyd, Tetra Tech, Inc.		Time:	NA		

**Subject:** Split spoon soil core sampled via hollow stem auger drilling techniques. Lithologic description: CLAY, yellow-red (5YR 4/6) mottled (25%) with brown-yellow (10YR 6/8) stiff, dry and WASTE (Anthropogenic fill), black granular salt cake, NH3 =>200 ppm.

Official Photograph No. 82	
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MW-05	Split	5-7 ft	Depth	6.2-7 ft
	Spoon:		Interval	
			in Photo:	
MW-05_5-7_ft(3).JPG		Date:	5/18/2012	
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA
		MW-05_5-7_ft(3).JP	MW-05_5-7_ft(3).JPG	in Photo:  MW-05_5-7_ft(3).JPG  Date:

**Subject:** Split spoon soil core sampled via hollow stem auger drilling techniques. Lithologic description: CLAY, yellow-red (5YR 4/6) mottled (25%) with brown-yellow (10YR 6/8) stiff, dry and WASTE (Anthropogenic fill), black granular salt cake, NH3 =>200 ppm.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

Official Photograph No. 83
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Boring	MW-05	Split	10-12 ft	Depth	11.3-12 ft
No:		Spoon:		Interval	
				in Photo:	
Image	MW-05_10-12_ft.JPG		Date:	5/18/2012	
No:					
Photogra	pher: Janna Peevler-Boyd, Tetra		Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled via hollow stem auger drilling techniques. Lithologic description: CLAY with chert, strong brown (7.5YR 5/8), very stiff, moderately plastic, moist, HN3 = 60 ppm.

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Boring No:	MW-05	Split Spoon:	15-17 ft	Depth Interval in Photo:	15-16.3 ft
Image No:	MW-05_15-17_ft(1).JPG			Date:	5/25/2012
Photograp Tech, Inc.	<b>Photographer:</b> Janna Peevler-Boyd, Tetra Tech, Inc.		Time:	NA	

**Subject:** Split spoon soil core sampled via hollow stem auger drilling techniques. Lithologic description: CLAY with chert, strong brown (7.5YR 5/8), very stiff, moderately plastic, moist, HN3 = 60 ppm.

Official Photograph No. 85
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MW-05	Split	15-17 ft	Depth	16.6-17 ft
	Spoon:		Interval	
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MW-05 15-17 ft(3).JPG			Date:	5/25/2012
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Photographer: Janna Peevler-Boyd, Tetra			Time:	NA
Tech, Inc.				
	MW-05_1	Spoon: MW-05_15-17_ft(3).	Spoon: MW-05_15-17_ft(3).JPG	Spoon: Interval in Photo:  MW-05_15-17_ft(3).JPG Date:

**Subject:** Split spoon soil core sampled via hollow stem auger drilling techniques. Lithologic description: SILTY CLAY with GRAVEL, strong brown (7.5YR 5/8), soft, plastic, moist.

J.M. Waller Associates, Inc. Remedial Action Contract II Lite, Region IV, Photographic Log

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Boring	MW-05	Split	17-19 ft	Depth	17-18 ft
No:		Spoon:		Interval	
				in Photo:	
Image	MW-05_17-19_ft(1).JPG			Date:	5/25/2012
No:					
Photogra	Photographer: Janna Peevler-Boyd, Tetra			Time:	NA
Tech, Inc.					

**Subject:** Split spoon soil core sampled via hollow stem auger drilling techniques. Lithologic description: SILTY CLAY with GRAVEL, strong brown (7.5YR 5/8), soft, plastic, moist.



Boring No:	MW-05	Split Spoon:	17-19 ft	Depth Interval	18-19 ft
				in Photo:	
Image	MW-05 17-19 ft(2).JPG			Date:	5/25/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled via hollow stem auger drilling techniques. Lithologic description: SILTY CLAY with GRAVEL, strong brown (7.5YR 5/8), soft, plastic, moist.

J.M. Waller Associates, Inc. Remedial Action Contract II Lite, Region IV, Photographic Log



Boring No:	MW- 07(1)	Split Spoon:	5-7 ft	Depth Interval in Photo:	6-7 ft
Image No:	MW-07(1)_5-7_ft(2).JPG			Date:	5/18/2012
Photographer: Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	NA	

**Subject:** Split spoon soil core sampled via hollow stem auger drilling techniques. Lithologic description: CLAY, dark olive-brown (2.5Y 3/3) mottled (25%) with olive-yellow (2.5Y 6/8), very stiff, slightly plastic, dry and WASTE (Anthropogenic Fill), wood, rubber, concrete.

J.M. Waller Associates, Inc. Remedial Action Contract II Lite, Region IV, Photographic Log

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Boring	MW-	Split	5-7 ft	Depth	5-6 ft
No:	07(2)	Spoon:		Interval	
				in Photo:	
Image	MW-07(2)_5-7_ft(1).JPG			Date:	5/18/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled via hollow stem auger drilling techniques. Lithologic description: CLAY, dark red (2.5 YR 3/6), very stiff, dry

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Boring No:	MW- 07(2)	Split Spoon:	5-7 ft	Depth Interval in Photo:	6-7 ft
Image No:	MW-07(2)_5-7_ft(2).JPG			Date:	5/18/2012
<b>Photographer:</b> Janna Peevler-Boyd, Tetra Tech, Inc.				Time:	NA

**Subject:** Split spoon soil core sampled via hollow stem auger drilling techniques. Lithologic description: CLAY, dark red (2.5 YR 3/6), very stiff, dry and WASTE (Anthropogenic fill), black, granular, ammonia odor.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

Official Photograph No. 91

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	Boring
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	Tech, Inc.
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	technique
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Smokey Mountain Smelter Site
Knoxville, Knox County, Tennessee

Boring	MW-	Split	5-7 ft	Depth	6-7 ft
No:	07A	Spoon:		Interval	
				in Photo:	
Image	MW-07(N)_5-7_ft.JPG			Date:	5/22/2012
No:					
Photogra	ographer: Janna Peevler-Boyd, Tetra			Time:	NA
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-07A via hollow stem auger drilling techniques. Lithologic description: CLAY, strong brown (7.5YR 5/8) stiff, dry, laminated fabric.



Boring No:	MW- 07A	Split Spoon:	10-12 ft	Depth Interval in Photo:	10-11 ft
Image No:	MW-07(N)_10-12_ft(1).JPG			Date:	5/22/2012
<b>Photographer:</b> Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	NA	

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-07A via hollow stem auger drilling techniques. Lithologic description: CLAY, strong brown (7.5YR 5/8) stiff, dry, laminated fabric.

Official Photograph No. 93
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MW-	Split	10-12 ft	Depth	11-12 ft
07A	Spoon:		Interval	
			in Photo:	
MW-07(N) 10-12 ft(2).JPG			Date:	5/22/2012
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA
Tech, Inc.				
	07A MW-07(N	07A <b>Spoon:</b> MW-07(N)_10-12_ft	07A <b>Spoon:</b> MW-07(N)_10-12_ft(2).JPG	07A Spoon: Interval in Photo:  MW-07(N)_10-12_ft(2).JPG Date:

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

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Boring	MW-	Split	10-12 ft	Depth	11.1-12 ft
No:	07A	Spoon:		Interval	
				in Photo:	
Image	MW-07(N)_10-12_ft(3).JPG			Date:	5/22/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-07A via hollow stem auger drilling techniques. Lithologic description: CLAY, strong brown (7.5YR 5/8) stiff, dry, laminated fabric.



Boring No:	MW- 07A	Split Spoon:	15-17 ft	Depth Interval in Photo:	15-16.1 ft
Image No:	MW-07(N)_15-17_ft(1).JPG			Date:	5/22/2012
Photographer: Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	NA	

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-07A via hollow stem auger drilling techniques. Lithologic description: SANDY CLAY with GRAVEL, strong brown (7.5YR 6/8), very soft, moist.

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Boring No:	MW- 07A	Split Spoon:	15-17 ft	Depth Interval in Photo:	16-17 ft
Image	MW-07(N)_15-17_ft(2).JPG			Date:	5/22/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-07A via hollow stem auger drilling techniques. Lithologic description: SANDY CLAY with GRAVEL, strong brown (7.5YR 6/8), very soft, moist.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

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Boring	MW-	Split	20-22 ft	Depth	20-21 ft
No:	07A	Spoon:		Interval	
				in Photo:	
Image	MW-07(N)_20-22_ft(1).JPG			Date:	5/22/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-07A via hollow stem auger drilling techniques. Lithologic description: SANDY CLAY with angular cherty GRAVEL, strong brown (7.5YR 6/8) stiff, slightly plastic, moist.



Boring No:	MW- 07A	Split Spoon:	20-22 ft	Depth Interval in Photo:	21-22 ft
Image No:	MW-07(N)_20-22_ft(2).JPG			Date:	5/22/2012
<b>Photographer:</b> Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	NA	

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-07A via hollow stem auger drilling techniques. Lithologic description: SANDY CLAY with angular cherty GRAVEL, strong brown (7.5YR 6/8) stiff, slightly plastic, moist.

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Boring No:	MW- 07A	Split Spoon:	25-27 ft	Depth Interval in Photo:	26-27 ft
Image	MW-07(N)_25-27_ft.JPG			Date:	5/22/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-07A via hollow stem auger drilling techniques. Lithologic description: SANDY CLAY with dolomitic GRAVEL, strong brown (7.5YR 6/8) very soft, moist and LIMESTONE, grey and white, crystalline, dolomitic.

J.M. Waller Associates, Inc.
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Boring	MW-08	Split	5-7 ft	Depth	6-7 ft
No:		Spoon:		Interval	
				in Photo:	
Image	MW-08_5-7_ft_(1).JPG			Date:	5/17/2012
No:					
Photogra	rapher: Janna Peevler-Boyd, Tetra			Time:	NA
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-08A via hollow stem auger drilling techniques. Lithologic description: CLAY, red (2.5YR 4/8) mottled (25%) with brown-yellow (10YR 6/8), very stiff, dry.



Boring No:	MW-08	Split Spoon:	10-12 ft	Depth Interval in Photo:	11-12 ft
Image No:	MW-08_10-12_ft_(2).JPG			Date:	5/17/2012
Photographer: Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	NA	

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-08A via hollow stem auger drilling techniques. Lithologic description: SANDY CLAY, yellow-red (5YR 5/6), soft, slightly plastic, moist.

	Official Photograph No. 102	
UI	<b>.</b> 45678	

Boring No:	MW-08	Split Spoon:	15-17 ft	Depth Interval in Photo:	15-16 ft
Image	MW-08_15-17_ft_(1).JPG			Date:	5/17/2012
No:					
Photogra	Photographer: Janna Peevler-Boyd, Tetra			Time:	NA
Tech, Inc.	• •				

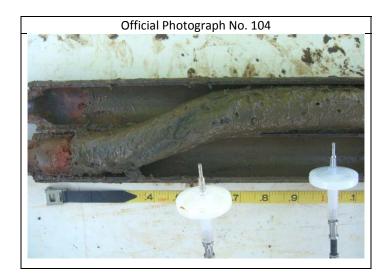
**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-08A via hollow stem auger drilling techniques. Lithologic description: SANDY CLAY with chert GRAVEL, dark red (2.5YR 3/6) soft, plastic, moist.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

	Official Photograph No. 103
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Boring	MW-08	Split	15-17 ft	Depth	16-17 ft
No:		Spoon:		Interval	
				in Photo:	
Image	MW-08_15-17_ft_(2).JPG			Date:	5/17/2012
No:					
Photogra	Photographer: Janna Peevler-Boyd, Tetra			Time:	NA
Tech, Inc.	<b>3</b> .				

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-08A via hollow stem auger drilling techniques. Lithologic description: SANDY CLAY with chert GRAVEL, dark red (2.5YR 3/6) soft, plastic, moist.



Boring No:	MW-08	Split Spoon:	20-22 ft	Depth Interval in Photo:	20-21 ft
Image No:	MW-08_20-22_ft_(1).JPG			Date:	5/17/2012
Photographer: Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	NA	

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-08A via hollow stem auger drilling techniques. Lithologic description: SANDY CLAY with chert GRAVEL, dark yellow-brown (10YR 4/6) very soft, nonplastic, very moist.

Off	icial Photograph	n No. 105	
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Boring No:	MW-08	Split Spoon:	20-22 ft	Depth Interval in Photo:	21.1-22 ft
Image	MW-08_20-22_ft_(3).JPG			Date:	5/17/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-08A via hollow stem auger drilling techniques. Lithologic description: SANDY CLAY with chert GRAVEL, dark yellow-brown (10YR 4/6) very soft, nonplastic, very moist.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

	Official	Photograp	h No. 106		
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Boring	MW-08	Split	25-27 ft	Depth	shoe
No:		Spoon:		Interval	
				in Photo:	
Image	MW-08_25-27_ft.JPG			Date:	5/17/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra				Time:	NA
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-08A via hollow stem auger drilling techniques. Lithologic description: CLAY with GRAVEL, brown, (10YR 4/3), very soft, nonplastic, moist.



Boring No:	MW-08	Split Spoon:	30-32 ft	Depth Interval in Photo:	30-31 ft
Image No:	MW-08_30-32_ft_(1).JPG			Date:	5/17/2012
<b>Photographer:</b> Janna Peevler-Boyd, Tetra Tech, Inc.				Time:	NA

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-08A via hollow stem auger drilling techniques. Lithologic description: SANDY CLAY with angular GRAVEL, brown (10YR 4/3), very soft, very moist.

Official Photograph No. 108						
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MW-08	Split	30-32 ft	Depth	31-32 ft
	Spoon:		Interval	
			in Photo:	
MW-08_30-32_ft_(2).JPG			Date:	5/17/2012
pher: Janna	Time:	NA		
Tech, Inc.				
	MW-08_3	Spoon: MW-08_30-32_ft_(2	Spoon:	Spoon: Interval in Photo:  MW-08_30-32_ft_(2).JPG Date:

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-08A via hollow stem auger drilling techniques. Lithologic description: SANDY CLAY with angular GRAVEL, brown (10YR 4/3), very soft, very moist.

J.M. Waller Associates, Inc. Remedial Action Contract II Lite, Region IV, Photographic Log

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Boring	MW-08	Split	35-37 ft	Depth	35-36 ft
No:		Spoon:		Interval	
				in Photo:	
Image	MW-08_35-37_ft_(1).JPG			Date:	5/17/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra				Time:	NA
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-08A via hollow stem auger drilling techniques. Lithologic description: SANDY CLAY with angular GRAVEL, dark yellow-brown (10YR 3/6), very soft, slightly plastic, very moist.



MW-08	Split	35-37 ft	Depth	36-37 ft
	Spoon:		Interval	
			in Photo:	
MW-08_35-37_ft_(2).JPG			Date:	5/17/2012
Photographer: Janna Peevler-Boyd, Tetra				NA
Tech, Inc.				
	MW-08_3	Spoon: MW-08_35-37_ft_(2	Spoon: MW-08_35-37_ft_(2).JPG	Spoon: Interval in Photo:  MW-08_35-37_ft_(2).JPG Date:

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-08A via hollow stem auger drilling techniques. Lithologic description: SANDY CLAY with angular GRAVEL, dark yellow-brown (10YR 3/6), very soft, slightly plastic, very moist.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

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Smokey Mountain Smelter Site
Knoxville, Knox County, Tennessee

Boring	MW-09	Split	10-12 ft	Depth	10-12 ft
No:		Spoon:		Interval	
				in Photo:	
Image	MW-09_10-12_ft.JPG			Date:	5/14/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled via hollow stem auger drilling techniques. Lithologic description: GRAVELY CLAY, brown (7.5YR 4/4), slightly plastic, moist.



Boring No:	MW-09	Split Spoon:	15-17 ft	Depth Interval in Photo:	15-17 ft
Image No:	MW-09_15-17_ft(1).JPG			Date:	5/14/2012
<b>Photographer:</b> Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	NA	

**Subject:** Split spoon soil core sampled via hollow stem auger drilling techniques. Lithologic description: CLAY, mottled dark yellowbrown, very stiff, slightly plastic, dry.

Official Photograph No. 113
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MW-09	Split	20-22 ft	Depth	20-22 ft
	Spoon:		Interval	
			in Photo:	
MW-09_20-22_ft(1).JPG			Date:	5/14/2012
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA
Tech, Inc.				
	MW-09_2	Spoon: MW-09_20-22_ft(1).	Spoon: MW-09_20-22_ft(1).JPG	Spoon: Interval in Photo:  MW-09_20-22_ft(1).JPG Date:

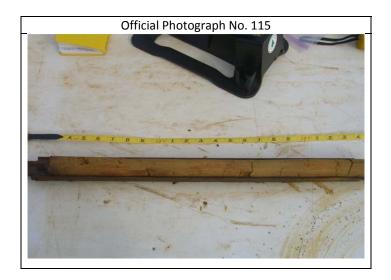
**Subject:** Split spoon soil core sampled via hollow stem auger drilling techniques. Lithologic description: CLAY, mottled dark yellow-brown, very stiff, slightly plastic, dry and CLAY, as above, with fragments of dolomitic LIMESTONE.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

	Official	Photograph N	lo. 114	_
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Boring	MW-10	Split	5-7 ft	Depth	5-7 ft
No:		Spoon:		Interval	
				in Photo:	
Image	MW-10_5-7_ft(1).JPG			Date:	5/14/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-10A via hollow stem auger drilling techniques. Lithologic description: CLAY, mottled strong brown (7.5YR 5/8), very stiff, slightly plastic, dry, layered fabric.



Boring No:	MW-10	Split Spoon:	10-12 ft	Depth Interval in Photo:	10-12 ft
Image No:	MW-10_10-12_ft(1).JPG			Date:	5/14/2012
Photograp Tech, Inc.	<b>Photographer:</b> Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	NA

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-10A via hollow stem auger drilling techniques. Lithologic description: CLAY, strong brown (7.5YR 5/8), very stiff, slightly plastic, dry, layered fabric.

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Boring No:	MW-10	Split Spoon:	15-17 ft	Depth Interval in Photo:	15-17 ft
Image	MW-10_15-17_ft.JPG			Date:	5/14/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-10A via hollow stem auger drilling techniques. Lithologic description: CLAY, mottled strong brown (7.5YR 4/6), very stiff, slightly plastic, dry.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

Official Photograph No. 117
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Boring	MW-10	Split	20-22 ft	Depth	20-22 ft
No:		Spoon:		Interval	
				in Photo:	
Image	MW-10_20-22_ft(1).JPG		Date:	5/14/2012	
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-10A via hollow stem auger drilling techniques. Lithologic description: CLAY with 10% chert GRAVEL, dark red (2.5YR 3/6), grades from stiff to soft and from dry to very moist with increasing depth.



Boring No:	MW-10	Split Spoon:	25-27 ft	Depth Interval in Photo:	25-26.9 ft
Image No:	MW-10_25-27_ft.JPG			Date:	5/14/2012
<b>Photographer:</b> Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	NA	

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-10A via hollow stem auger drilling techniques. Lithologic description: CLAY with 10% chert GRAVEL, dark red (2.5YR 3/6), grades from stiff to soft and from dry to very moist with increasing depth.



Boring No:	MW-10	Split Spoon:	30-32 ft	Depth Interval in Photo:	30-31.7 ft
Image	MW-10_30-32_ft(1).JPG		Date:	5/14/2012	
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled during the installation of groundwater monitoring well MW-10A via hollow stem auger drilling techniques. Lithologic description: CLAY with chert GRAVEL, yellowbrown (10YR 5/8), very stiff, dry.

J.M. Waller Associates, Inc. Remedial Action Contract II Lite, Region IV, Photographic Log

Official Photograph No. 120
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Boring No:	MW- 11(1)	Split Spoon:	5-7 ft	Depth Interval in Photo:	6-7 ft
Image	MW-11(1)_5-7_ft.JPG			Date:	6/01/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled via hollow stem auger drilling techniques. Lithologic description: CLAY, dark brown (7.5YR 3/4), very soft, moist and WASTE (Anthropogenic Fill), concrete, steel.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

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Boring	MW-	Split	5-7 ft	Depth	5-6 ft
No:	11(2)	Spoon:		Interval	
				in Photo:	
Image	MW-11(2)5-7_ft(1).JPG			Date:	6/01/2012
No:					
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA	
Tech, Inc.					

**Subject:** Split spoon soil core sampled via hollow stem auger drilling techniques. Lithologic description: CLAY with WASTE (concrete and aluminum), strong brown (7.5YR 4/6).

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Boring No:	MW- 11(2)	Split Spoon:	5-7 ft	Depth Interval in Photo:	6-7 ft
Image No:	MW-11(2)5-7_ft(2).JPG			Date:	6/01/2012
Photographer: Janna Peevler-Boyd, Tetra Tech, Inc.			Time:	NA	

**Subject:** Split spoon soil core sampled via hollow stem auger drilling techniques. Lithologic description: CLAY with WASTE (concrete and aluminum), strong brown (7.5YR 4/6).

Official Photograph No. 123
1   FT 1   2   .3   .4   .5   .6   .7   .8   9   2   FT 1   .2

MW-	Split	7-9 ft	Depth	8-9 ft
11(2)	Spoon:		Interval	
			in Photo:	
MW-11(2)7-9 ft(2).JPG		Date:	6/01/2012	
Photographer: Janna Peevler-Boyd, Tetra			Time:	NA
Tech, Inc.				
	11(2) MW-11(2	11(2) Spoon: MW-11(2)7-9_ft(2).J	11(2) <b>Spoon:</b> MW-11(2)7-9_ft(2).JPG	11(2) Spoon: Interval in Photo:  MW-11(2)7-9_ft(2).JPG Date:

**Subject:** Split spoon soil core sampled via hollow stem auger drilling techniques. Lithologic description: CLAY with WASTE (concrete and aluminum), strong brown (7.5YR 4/6).

## J.M. Waller Associates, Inc. Remedial Action Contract II Lite, Region IV, Photo Log

Contract: Task No.:	EP-S4-08-03 019	Site Name: Date:	Smokey Mountain May 2012	n Smelters	
RPM:	Rusty Kestle	Project Mgt.:	Janice Austin		
		PHOT	O LOG		
		ACKNOWLE	EDGEMENTS		
SIGNATURE	Date:		PM SIGNATURE	Date:	



### OFFICIAL PHOTOGRAPH NO.: 1 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Center of SMS site **Date:** May 10, 2012

**Photo Number:** DSCI0071 Time: 1105

**Orientation:** South

**Photographer:** Terence Chuhay, J. M. Waller Associates

**Subject:** View of newly constructed gravel road leading to proposed well/boring locations: MW03, MW04,

MW05, and MW06.



### OFFICIAL PHOTOGRAPH NO.: 2 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Northeast portion of SMS site **Date:** May 10, 2012

**Photo Number:** DSCI0074 Time: 1140

**Orientation:** Northeast

**Photographer:** Terence Chuhay, J. M. Waller Associates

Subject: View of newly constructed gravel road leading to proposed monitor well/boring locations: MW10A

and MW10B. (Grass was mowed soon after this photo was taken.)



### OFFICIAL PHOTOGRAPH NO.: 3 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Center of SMS site **Date:** May 10, 2012

**Photo Number:** DSCI0075 Time: 1141

**Orientation:** East southeast

**Photographer:** Terence Chuhay, J. M. Waller Associates

**Subject:** View of newly placed gravel road to proposed monitor well/boring locations MW01 and MW02.



### OFFICIAL PHOTOGRAPH NO.: 4 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Center of SMS Site **Date:** May 14, 2012

**Photo Number:** DSCI0076 Time: 1642

**Orientation:** West

**Photographer:** Terence Chuhay, J. M. Waller Associates

Subject: View of Investigative Derived Waste management area. View of 20 yard roll-off on left, auger rig

decontamination pad in center, and vertical plastic 6900 gallon tank for wastewater.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

Smokey Mountain Smelter Site
Knoxville, Knox County, Tennessee

Boring	MW-	Depth	0-5 ft	Date:	5/20/2013
No:	11B	Interval			
Image	Image IMAG1474.jpg				16:41
No:				Time:	
Photographer: Matt Miller					

**Subject:** Geoprobe Macrocore (direct push) soil core sample obtained during the installation of groundwater monitoring well MW-11B. Core contains silty and sandy clay, with inclusions of shale.

Official Photograph No. 1
Official Photograph No. 1

Official Photograph No. 2
Official Filotograph No. 2
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Boring No:	MW 11B		Depth Interval	5-10 ft.	Date:	5/20/2013
Image No:		IMAG1476.jpg			Time:	16:50
Photographer:			Matt	Miller		

**Subject:** Geoprobe Macrocore (direct push) soil core sample obtained during the installation of groundwater monitoring well MW-11B. Core contains silty and sandy clay, with inclusions of shale.

Official Photograph No. 3
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Boring No:	MW 11B		Depth Interval	10-15 ft.	Date:	5/20/2013
Image No:		IN	/IAG1478.jp	g	Time:	16:56
Photogra			Matt	Miller		

**Subject:** Geoprobe Macrocore (direct push) soil core sample obtained during the installation of groundwater monitoring well MW-11B. Core contains silty and sandy clay, with inclusions of shale.

J.M. Waller Associates, II Remedial Action Contrac

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Boring No:	MW 11B		Depth Interval	15-20 ft.	Date:	5/20/2013
Image No:	IMAG1480.jpg				Time:	17:03
Photographer:				Matt	Miller	

**Subject:** Geoprobe Macrocore (direct push) soil core sample obtained during the installation of groundwater monitoring well MW-11B. Core contains silty and sandy clay, with inclusions of shale.





Boring No:	MW 11B		Depth Interval	20-25 ft.	Date:	5/20/2013
Image No:		IMAG1482.jpg			Time:	17:12
Photographer:				Matt	Miller	

**Subject:** Geoprobe Macrocore (direct push) soil core sample obtained during the installation of groundwater monitoring well MW-11B. Core contains weathered of shale and sandstone and fragmented limestone.

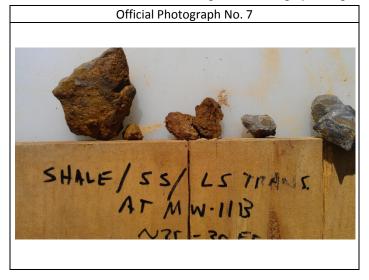
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Boring No:	MW- 11B		Depth Interval	25-30 ft.	Date:	5/20/2013
Image No:		IMAG1487.jpg			Time:	17:29
Photogra	Photographer:			Matt	Miller	

Subject: Geoprobe Macrocore (direct push) soil core sample obtained during the installation of groundwater monitoring well MW-11B. Core contains weathered of shale and sandstone and fragmented limestone.

Boring No:	MW- 11B	Depth Interval	25-30 ft.	Date:	5/28/2013
Image No:	II	MAG1559.jp	og	Time:	13:59
Photogra	Photographer:		Matt	Miller	

**Subject:** 3.25" ID rock core bit cuttings obtained during the installation of groundwater monitoring well MW-11B. Semiconsolidated nature of lithology prohibited direct push sampling, but was soft enough prohibit obtaining good core samples. These cuttings are representative of the weathered sandstone and shale with inclusions of sandy limestone encountered to approximately 37 ft depth.



Official Photograph No. 8
SWS MW-13 B-CORE

Boring No:	MW 11B		Depth Interval	37-42 ft.	Date:	5/30/2013
Image No:	IMAG1593.jpg			Time:	14:29	
Photogra	pher:		Matt	Miller		

**Subject:** 2.5" rock core obtained during the installation of groundwater monitoring well MW-11B. The core contains sandy limestone grading to sandstone. Note relic bedding and bedding parallel stylolites.

Official Photograph No. 9
Official Priotograph No. 9

Boring No:	MW- 11B		Depth Interval	42-44 ft.	Date:	5/30/2013
Image No:		IMAG1594.jpg			Time:	14:40
Photogra	hotographer:			Matt	Miller	

**Subject:** 2.5" rock core (uppermost core in photograph) obtained during the installation of groundwater monitoring well MW-11B.. The core contains sandy limestone grading to sandstone. Note relic bedding and bedding parallel stylolites.

Boring No:	MW- 11B		Depth Interval	44-49 ft.	Date:	5/30/2013
Image No:	IMAG1595.jpg			Time:	14:46	
Photographer:			Matt	Miller		

**Subject:** 2.5" rock core (uppermost core in photograph) obtained during the installation of groundwater monitoring well MW-11B. The core contains sandy limestone grading to sandstone. Note relic bedding, calcitic vein fill, and iron oxide stained fractures.





Boring No:	MW 11B		Depth Interval	49-54 ft.	Date:	5/30/2013
Image No:		IMAG1598.jpg			Time:	14:51
Photogra	apher:		Matt	Miller		

**Subject:** 2.5" rock core (uppermost core in photograph) obtained during the installation of groundwater monitoring well MW-11B. The core contains sandy limestone grading to sandstone. Note relic bedding, calcitic vein fill, and iron oxide stained fractures.

Official Photograph No. 12
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Boring No:	MW- 11B		Depth Interval	54-57 ft.	Date:	5/30/2013
Image No:		IN	/AG1601.jp	g	Time:	15:23
Photographer:			Matt	Miller	•	

**Subject:** 2.5" rock core (uppermost core in photograph) obtained during the installation of groundwater monitoring well MW-11B. The core contains sandy limestone grading to sandstone. Note relic bedding, calcitic vein fill, and iron oxide stained fractures.



Boring No:	MW-11B	Depth Interval	~50 ft	Date:	5/30/2013
Image	IN	IMAG1597.jpg			14:46
No:	111	//AG1397.jp	5	Time:	14.40
Photogra	pher:	: Matt Miller			

**Subject:** 2.5" rock core obtained from approximately 50 ft depth during the installation of groundwater monitoring well MW-11B. This photograph highlights the features of the screened groundwater production zone in the bedrock at MW-11B. Note the relic bedding with evidence of pressure solution parallel to bedding, fracturing and calcite vein fill discordant to bedding, evidence of slip along bedding planes in the form of truncated calcite veins, and open fractures (iron oxide staining) contrasting with drilling induced fractures (left of image). Groundwater migration along open fractures is recorded by iron oxide staining in open fractures.

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Remedial Action Contract II Lite, Region IV, Photographic Log

Smokey Mountain Smelter Site
Knoxville, Knox County, Tennessee

Official Photograph No. 14

Boring No:	MW 12A/		Depth Interval	5-10 ft	Date:	5/20/2013
Image No:		IN	//AG1437.jp	Time:	13:57	
Photogra	rapher:			Matt	Miller	

**Subject:** Geoprobe Macrocore (direct push) soil core sample obtained during the installation of groundwater monitoring well MW-12A/B. Core contains silty and sandy clay, with inclusions of shale.

Official Photograph No. 15

Boring No:	MW 12A/		Depth Interval	10-15 ft	Date:	5/20/2013
Image No:		IN	/AG1439.jp	Time:	14:04	
Photogra	ographer:				Miller	

**Subject:** Geoprobe Macrocore (direct push) soil core sample obtained during the installation of groundwater monitoring well MW-12A/B. Core contains silty and sandy clay, with inclusions of shale.

Official Photograph No. 16

Boring No:	MW 12A/		Depth Interval	15-20 ft	Date:	5/20/2013
Image No:		IN	ЛАG1441.jp	Time:	14:11	
Photographer:				Matt	Miller	

**Subject:** Geoprobe Macrocore (direct push) soil core sample obtained during the installation of groundwater monitoring well MW-12A/B. Core contains silty and sandy clay, with inclusions of shale.

J.M. Waller Associates, Inc. Remedial Action Contract II Lite, Region IV, Photographic Log

Official Photograph No. 17	Boring	MW-	Depth
	No:	12A/B	Interval
	Image		MAG1444.j
	No:		VIAG1444.J
	Photogra	pher:	
	obtained o	during the	Macrocore installation ntains silty

Boring No:	MW 12A/		Depth Interval	20-25 ft	Date:	5/20/2013
Image No:		IN	ЛАG1444.jp	Time:	14:23	
Photographer:				Matt	Miller	

**Subject:** Geoprobe Macrocore (direct push) soil core sample obtained during the installation of groundwater monitoring well MW-12A/B. Core contains silty and sandy clay, with inclusions of shale

Official Photograph No. 18
Gillea Priotograph No. 18

Boring No:	MW 12A/		Depth Interval	25-28 ft	Date:	5/20/2013
Image No:	IMAG1448.jpg				Time:	14:36
Photogra	apher:				Miller	

**Subject:** Geoprobe Macrocore (direct push) soil core sample obtained during the installation of groundwater monitoring well MW-12A/B. Core contains silty and sandy clay, with inclusions of shale.

Official Photograph No. 19
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Boring No:	MW 12A/		Depth Interval	~28 ft	Date:	5/30/2013
Image No:		IN	/AG1449.jp	g	Time:	14:37
Photogra	pher:			Matt	Miller	

**Subject:** Shale and limestone fragments contained in Geoprobe Macrocore (direct push) soil core sample obtained at the weathered shale/limestone contact at approximately 28 ft depth during the installation of groundwater monitoring well MW-12A/B.

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Boring	MW-	Depth

Boring No:	MW 12A		Depth Interval	28-31 ft	Date:	5/21/2013
Image No:		IN	ЛАG1444.jp	Time:	16:05	
Photogra	pher: Matt Miller					

**Subject:** 3.25" rock core obtained during the installation of groundwater monitoring well MW-12A. Note brecciation, weathered open fractures with iron oxide staining, and calcite vein



# Official Photograph No. 21

Boring No:	MW 12A		Depth Interval	31-34 ft	Date:	5/21/2013
Image No:		IMAG1503.jpg			Time:	18:01
Photogra	pher:			Matt	Miller	

**Subject:** 3.25" rock core bit obtained during the installation of groundwater monitoring well MW-12A. Core recovery was near 100%, absence of rock due to void (karst or fault) encountered at 33-34 ft depth.

Boring No:	MW 12A		Depth Interval	34-39 ft	Date:	5/22/2013
Image No:		IMAG1510.jpg			Time:	10:13
Photogra	apher:			Matt	Miller	

**Subject:** 3.25" rock core obtained during the installation of groundwater monitoring well MW-12A. MW-12A was installed to be screened through the void in (Official Photograph 21) and the fracture network pictured here.

Boring No:	MW 12B		Depth Interval	42-44 ft	Date:	5/29/2013
Image No:	IMAG1580.jpg			g	Time:	12:22
Photogra	pher: N			Matt	Miller	

**Subject:** 2.5" rock core obtained during the installation of groundwater monitoring well MW-12B. Note brecciation, and calcite vein fill. Recovery 40-42 feet limited to only rock fragments due to excessive fracturing. Assumed similar lithology based on fragment lithology and driller's description of formation continuity/hardness





Boring No:	MW 12B		Depth Interval	44-49 ft	Date:	5/29/2013
Image No:		IMAG1582.jpg			Time:	13:34
Photogra	apher: Matt M			Miller		

**Subject:** 2.5" rock core obtained during the installation of groundwater monitoring well MW-12B. Note brecciation and iron oxide filled staining in open fractures.

Official Photograph No. 25
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Boring No:	MW 12B		Depth Interval	49-54 ft	Date:	5/29/2013
Image No:		IMAG1583.jpg			Time:	14:02
Photogra	apher:			Matt	Miller	

**Subject:** 2.5" rock core obtained during the installation of groundwater monitoring well MW-12B. Note brecciation.

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Remedial Action Contract II Lite, Region IV, Photographic Log

	Smokey Mountain Smelter Site							
Knoxville, Knox County, Tennessee								
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Official Photograph No. 26

Boring No:	MW- 12B	•	Depth Interval	54-59 ft	Date:	5/29/2013
Image No:	IMAG1585.jpg			Time:	12:44	
Photogra	pher: Matt N			Miller		

**Subject:** 2.5" rock core obtained during the installation of groundwater monitoring well MW-12B. Note brecciation, iron oxide staining in open fractures, and calcite vein fill.

Boring No:	MW 12B		Depth Interval	59-62 ft	Date:	5/29/2013
Image No:		IN	/IAG1590.jp	og	Time:	15:21
Photographer:			Matt	Miller		

**Subject:** 2.5" rock core obtained during the installation of groundwater monitoring well MW-12B. Note extensive iron oxide staining present in calcitic slickensided fractures/small faults within this brecciated limestone.

Official Photograph No. 28
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Boring No:	MW 12B		Depth Interval	59-62 ft	Date:	5/29/2013
Image No:		IN	//AG1591.jp	g	Time:	15:21
Photographer:				Matt	Miller	

**Subject:** Close up of fracture in Official Photograph No. 27. This photograph highlights the features of the screened groundwater production zone in the bedrock at MW-12B. The mineralogy is likely goethite and hematite and possibly pyrolusite (small sphereoidal to dendritic stains) within a slickensided calcite filled fracture, given the streaks produced by, and the crystal habits displayed by, this sample.

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Remedial Action Contract II Lite, Region IV, Photographic Log

Smokey Mountain Smelter Site Knoxville, Knox County, Tennessee

Boring No:	MW- 13A/I		Depth Interval	0-5 ft	Date:	5/20/2013
Image No:		IN	/AG1451.jp	)g	Time:	15:00
Photographer:				Matt	Miller	
	·					



**Subject:** Geoprobe Macrocore (direct push) soil core sample obtained during the installation of groundwater monitoring well MW-13A/B. Core contains silty and sandy clay, and cement/rock fill.





Boring No:	MW 13A/		Depth Interval	5-10 ft	Date:	5/20/2013
Image No:		IN	//AG1454.jp	og	Time:	15:11
Photographer:				Matt	Miller	

**Subject:** Geoprobe Macrocore (direct push) soil core sample obtained during the installation of groundwater monitoring well MW-13A/B. Core contains silty and sandy clay, with inclusions of shale.

Official Photograph No. 31
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Boring No:	MW- 13A/		Depth Interval	10-13 ft	Date:	5/20/2013
Image No:		IN	/AG1459.jp	g	Time:	15:26
Photographer:				Matt	Miller	

**Subject:** Geoprobe Macrocore (direct push) soil core sample obtained during the installation of groundwater monitoring well MW-13A/B. Core contains silty and sandy clay, with inclusions of shale.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

Boring No:	MW- 13A/		Depth Interval	13-15 ft	Date:	5/20/2013
Image No:		IN	ЛАG1461.jp	og	Time:	15:33
Photographer:				Matt	Miller	

**Subject:** Geoprobe Macrocore (direct push) soil core sample obtained during the installation of groundwater monitoring well MW-13A/B. Core contains silty and sandy clay with a remoulded texture and weathered shale (color transition from dark brown to tan).



Boring No:	MW 13A/		Depth Interval	15-20 ft	Date:	5/20/2013
Image No:		IN	/AG1463.jp	og	Time:	15:38
Photographer:			Matt	Miller		

**Subject:** Geoprobe Macrocore (direct push) soil core sample obtained during the installation of groundwater monitoring well MW-13A/B. Core contains weathered shale and silty and sandy clay.

Official Photograph No. 34
Official Priotograph No. 34

Boring No:	MW 13A/		Depth Interval	20-25 ft	Date:	5/20/2013
Image No:		IN	/AG1466.jp	g	Time:	15:44
Photogra			Matt	Miller	•	

**Subject:** Geoprobe Macrocore (direct push) soil core sample obtained during the installation of groundwater monitoring well MW-13A/B. Core contains weathered shale and silty and sandy clay.

J.M. Waller Associates, Inc.
Remedial Action Contract II Lite, Region IV, Photographic Log

Official Photograph No. 35
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Boring No:	MW- 13A/		Depth Interval	25-30 ft	Date:	5/20/2013
Image No:		IN	ЛАG1468.jp	Time:	15:53	
Photogra			Matt	Miller		

**Subject:** Geoprobe Macrocore (direct push) soil core sample obtained during the installation of groundwater monitoring well MW-13A/B. Core contains weathered shale and silty and sandy clay.

Official Photograph No. 36
30-35-

Boring No:	MW 13A/		Depth Interval	30-35 ft	Date:	5/20/2013
Image No:		IN	//AG1471.jp	og	Time:	16:06
Photographer:				Matt	Miller	

**Subject:** Geoprobe Macrocore (direct push) soil core sample obtained during the installation of groundwater monitoring well MW-13A/B. Core contains weathered shale and silty and sandy clay.

Official Photograph No. 37
SMW-138 CP 20 MAY 13 B 20 MAY 13 B 35-38

Boring No:	MW- 13A/		Depth Interval	35-38 ft	Date:	5/20/2013
Image No:		IN	/IAG1472.jp	Time:	16:10	
Photogra	pher:			Matt	Miller	

**Subject:** Geoprobe Macrocore (direct push) soil core sample obtained during the installation of groundwater monitoring well MW-13A/B. Core contains weathered shale and silty and sandy clay with minor fragments of limestone.

Boring No:	MW- 13B	-	Depth Interval	40-45 ft	Date:	5/23/2013
Image No:		IN	/AG1521.jp	)g	Time:	14:40
Photographer:				Matt	Miller	

**Subject:** 3.25" rock core obtained during the installation of groundwater monitoring well MW-13B. The core contains karsted and weathered limestone as well as weathered shale fragments in void filling mud. The weathered nature of the rock prevented recovery of a core from 38-40 ft depth. Lithology 38-40 ft assumed the same given the driller's description of formation hardness/continuity.

Official Photograph No. 38
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Boring	MW	-	Depth	40.45.64	D-4	F /22 /2012
No:	13B		Interval	40-45 ft	Date:	5/23/2013
Image	INAA C1 471 :-			.a	Time:	15.11
No:		Ш	//AG1471.jp	Jg Jg	mile.	15:11
Photographer:				Matt	Miller	

**Subject:** 3.25" rock core obtained during the installation of groundwater monitoring well MW-13B. The core contains karsted and weathered limestone as well as weathered shale fragments in void filling mud. Limestone fragments placed in sampling interval according to drillers description of formation hardness/continuity. (Mud and shale fragments cleaned from sample for clarity).

Official Photograph No. 40

Boring No:	MW- 13B	Depth Interval	45 ft	Date:	5/23/2013
Image No:	I	MAG1526.jp	g	Time:	15:13
Photogra	pher:		Matt	Miller	

**Subject:** 3.25" rock core obtained from 45 ft depth during the installation of groundwater monitoring well MW-13B. Note the allochemical grains etched in relief on karsted surface, iron oxide staining, sparry texture (dark grey) outside of the fracture zone, and calcitic vein fill.

Off	icial Photo	graph No. 4	41	
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Boring No:	MW 13B		Depth Interval	45-50 ft	Date:	5/23/2013
Image No:		IN	//AG1530.jp	og	Time:	17:01
Photogra	rapher:			Matt	Miller	

**Subject:** 3.25" rock core obtained during the installation of groundwater monitoring well MW-13B. The core contains karsted and weathered limestone. Note the light grey fossiliferous and sparry texture of the upper (left side in photograph) section of core in comparison to the dark grey shaley texture of the lower (right side in photograph).

Boring	MW	-	Depth	50-54 ft	Date:	5/28/2013
No:	13B	,	Interval	30-34 IL	Date.	3/26/2013
Image		IIV	/AG1560.jr	nσ	Time:	15:08
No:		111	//AG1500.jp	75	mile.	15.00
Photogra	pher:			Matt	Miller	

**Subject:** 2.5" rock core obtained during the installation of groundwater monitoring well MW-13B. The core contains fractured shaley limestone. The 50-52.5 ft interval was lost after multiple drilling attempts recovered only fragmented pieces of the same lithology.

Official Photograph N	lo. 43
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Boring No:	MW 13B		Depth Interval	54-59 ft	Date:	5/28/2013
Image No:		IN	/AG1562.jp	g	Time:	15:37
Photogra	apher:			Matt	Miller	

**Subject:** 2.5" rock core obtained during the installation of groundwater monitoring well MW-13B. Note the near vertical, shaley, relic bedding.

Boring No:	MW 13B		Depth Interval	59-64 ft	Date:	5/28/2013
Image No:		IN	//AG1567.jp	g	Time:	17:41
Photogra	pher:			Matt	Miller	
	•		•			

**Subject:** 2.5" rock core obtained during the installation of groundwater monitoring well MW-13B. The core contains fossiliferous and shaley limestone.

Official Photograph No. 44
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Boring No:	MW 13B		Depth Interval	64-69 ft	Date:	5/28/2013
Image No:		IN	/IAG1568.jp	og	Time:	17:51
Photogra	pher:			Matt	Miller	

**Subject:** 2.5" rock core obtained during the installation of groundwater monitoring well MW-13B. The core contains fractured shaley limestone. Note the shaley cleavage and iron oxide staining.

Official Photograph No. 46
S MS MW-13 B-Coke 28 MM+13 GP 69-72

Boring No:	MW- 13B		Depth Interval	54-59 ft	Date:	5/28/2013
Image No:		IN	/AG1562.jp	g	Time:	15:37
Photogra	pher:			Matt	Miller	

**Subject:** 2.5" rock core obtained during the installation of groundwater monitoring well MW-13B. Note the near vertical shaley relic bedding and iron oxide staining in a natural fracture. Closed fractures likely occurred parallel to bedding planes during drilling action.



Boring No:	MW-13B	Depth Interval	~59 ft	Date:	5/28/2013		
Image	IN	IMAG1565 ing		IMAG1565.jpg		Time:	15:38
No:	117	liviAd1363.jpg		Tille.	15.56		
Photogra	pher:	Matt Miller					

**Subject:** 2.5" rock core obtained from approximately 59 ft depth during the installation of groundwater monitoring well MW-13B. This photograph highlights the features of the screened groundwater production zone in the bedrock at MW-13B. Note the nearly vertically oriented relic shaley bedding and iron oxide staining in a natural fracture.



Location:	C:	SX Railroad Cut	Orientation:	Looking East	Date:	5/28/2013
Image No:		S13F0SAGD03			Time:	10:11
Photographer:				Terence Chuhay		

**Subject:** Fault exposure between shale and limestone members of the Ordovician Ottosey Shale. The exposed fault plane contains slickenlines and dips near vertical. The trend of the fault, as estimated from exposures on both sides of the CSX railroad cut, runs roughly northeast – southwest. This photograph is taken roughly due west of the MW-12A/B well cluster.



Location:	Unnamed Tributary	Orientation:	Looking North (Upstream)	Date:	5/29/2013
Image No:		IMAG1576.jpg			11:01
Photographer:			Matt Miller		

**Subject:** Synformal fold forming the Unnamed Tributary stream channel on the eastern edge of the site. In this image, shaley, micritic limestone (left) is folded to near vertical bedding orientation against a highly weathered sandstone (right). The same lithologic materials are noted elsewhere in the Unnamed Tributary channel (See Official Photograph 50) and in the subsurface at MW-07B and MW-11B.



Location:	Unnamed Tributary	Orientation:	Looking Southwest (Downstream)	Date:	5/29/2013
Image No:		IMAG1575.jpg			10:57
Photographer:			Matt Miller		

**Subject:** Micritic limestone contact with sandy shale in Unnamed Tributary stream channel on the eastern edge of the site. The same lithologic materials are noted elsewhere in the Unnamed Tributary channel (See Official Photograph 49) and in the subsurface at MW-07B and MW-11B.



Location:	SMS Decontamination	Orientation:	Looking North-Northeast	Date:	5/20/13-6/11/13
Image No:	A)IMAG1491.jpg, B) IMAG1516.jpg, C) IMAG1540.jpg, D) S13F0SAGD03IMAG1491.jpg			Time:	Various
Photographer: Matt Mill		ller (A-C), Terence Chul	nay (D)		

**Subject:** Decontamination pad and IDW holding area 5/20/2013 – 6/11/2013. A) Decon pad after initial erection, but prior to use. B) Decon pad in use, subject (M&W Drilling employee B. Lumpkin) is steam cleaning 6" diameter PVC used as temporary casing during well installation activities. C) Decon pad during the course of the project, covered to prevent rain water infiltration and runoff during non-work hours. D) IDW removal activities, subject (Unknown Marion Environmental, Inc. employee) removing wastewater via vacuum truck.



Location:	MW-11B	Orientation:	Looking East	Date:	5/28/13
Image No:		IMAG1556.jpg			13:50
Photograp	her:		Matt Miller		

**Subject:** M&W Drilling, Inc. driller B. Woods overboring MW-11B with a Schramm T450 air rotary drilling rig. This photo specifically depicts emplacement of Symmetrix temporary casing after rock coring into competent limestone. Note cutting collection system (hose to collection hopper out of frame), and saturated formation condition. No aqueous drilling fluids were added during this operation, cuttings were translated up the tool string using only forced air.



Location:	MW-13B	Orientation:	Looking North	Date:	5/28/13
Image No:		IMAG1561.jpg			15:25
Photograp	her:		Matt Miller		

**Subject:** M&W Drilling, Inc. driller Gary Aikens rock coring MW-13B with a Foremost B-59 Mobile rotary drilling rig. This photo specifically depicts coring operations to log the production (screened) zone in MW-13B.



Location:		MW-11A/B	Orientation:	Looking East	Date:	6/05/13
Image No:		IMAG1634.jpg			Time:	15:08
Photographer:		Matt Miller				

**Subject:** MW-11B (immediate foreground) and MW-11A surface completion (foreground). The Unnamed Tributary parallels the treeline seen in the background. Suface water seep SW-02 is colocated with the timber pile (background, left).



Location:		MW-12A/B	Orientation:	Looking Northwest	Date:	6/05/13
Image No:		IMAG1631.jpg			Time:	15:07
Photographer:		Matt Miller				

**Subject:** MW-12A and MW-12B (indicated in photo). The CSX Railroad cut is in the immediate background behind the treeline. The plastic 55-gallon drum empty, and has been used as a temporary well purge water holding vessel during groundwater sampling.



Location:	MW-13A/B	Orientation:	Looking Northeast	Date:	6/05/13	
Image No:		IMAG1635.jpg			15:09	
Photograp	her:	Matt Miller				

**Subject:** MW-13A and MW-13B (indicated in photo). The fence in background serves as the northern site/property boundary. The Nortfold Southern Railroad cut is in the immediate background behind the treeline.

### J.M. Waller Associates, Inc. Remedial Action Contract II Lite, Region IV, Photo Log

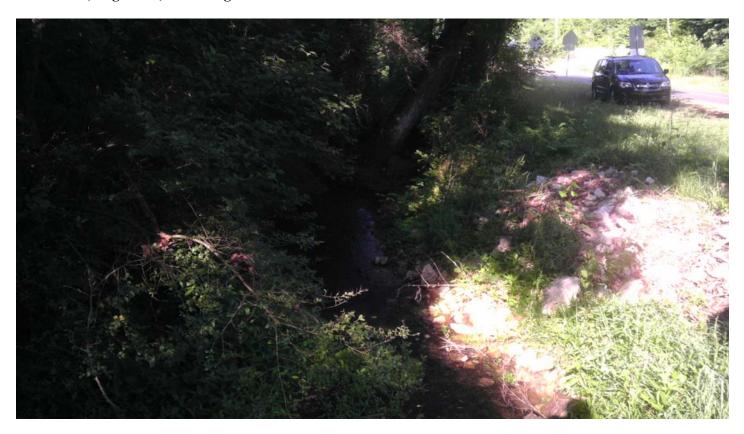
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Date:

Contract:	EP-S4-08-03	Site Name:	Smokey Mountain Smelters Site
Task No.:	019	Date:	June 22-26, 2014
RPM:	Rusty Kestle	Project Mgt.:	Janice Austin
PHOTO LOG			
			rned to Smokey Mountain Smelters for additional soi
vapor, ground	water, and surface w	ater sample collection	n. The following photographs show the sampling
locations for a	ll three media. Locat	ions are specified with	n each photograph.
ACKNOWLEDGEMENTS			
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PM SIGNATURE

Date:



### OFFICIAL PHOTOGRAPH NO. 1 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 22, 2014

**Photo Number:** Photo 1 Time: 08:44

**Orientation:** Facing Southwest

**Photographer:** CJ Roebuck

Subject: Surface water collection location SMSSW13, which is located on Flenniken Branch. There was a

steady stream of water flowing ideal for sampling. The location is southwest of the site.



### OFFICIAL PHOTOGRAPH NO. 2 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 22, 2014

**Photo Number:** Photo 2 **Time:** 14:56

**Orientation:** Facing North

**Photographer:** CJ Roebuck

**Subject:** Surface water collection location SMSSW09. This location is located on Flennikan Branch, southwest

of the site. There was standing water as well as flowing water to collect a sample.



### OFFICIAL PHOTOGRAPH NO. 3 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 22, 2014

**Photo Number:** Photo 3 Time: 15:20

**Orientation:** Facing North

**Photographer:** CJ Roebuck

**Subject:** Located on the west side of Flenniken branch, surface water location SMSSW14 was collected. The

location was behind some residential housing and needed to be hiked to from the street.



### OFFICIAL PHOTOGRAPH NO. 4 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 23, 2014

**Photo Number:** Photo 4 Time: 08:47

**Orientation:** Facing North

**Photographer:** CJ Roebuck

**Subject:** Surface water collection location SMSSW09SPRING, located on the northwest side of Flenniken

Branch, west of the site. The majority of the area had very still water for sampling.



### OFFICIAL PHOTOGRAPH NO. 5 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters **Date:** June 23, 2014

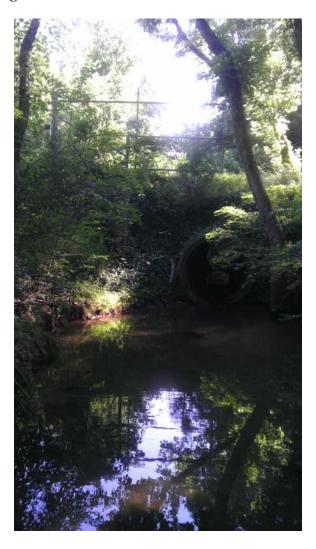
**Photo Number:** Photo 5 Time: 09:08

**Orientation:** Facing North

**Photographer:** CJ Roebuck

**Subject:** Surface water collection location SMSSW08SPRING, found on the North side of Flenniken Branch.

Location found south of the CSX Railroad and on the other side of the bank from SMSSW08.



### OFFICIAL PHOTOGRAPH NO. 6 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 23, 2014

**Photo Number:** Photo 6 Time: 09:21

**Orientation:** Facing North

**Photographer:** CJ Roebuck

**Subject:** Surface water collection location SMSSW08 on the south side of Flenniken Branch. Location

southeast of the CSX Railroad.



### OFFICIAL PHOTOGRAPH NO. 7 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 23, 2014

**Photo Number:** Photo 7 Time: 10:26

**Orientation:** Facing Northeast

**Photographer:** CJ Roebuck

**Subject:** Surface water collection location SMSSW12, located southeast of the CSX railroad and west of the

site. Location was dry and not sampled. Area was barely moist where flowing water would've been

found.



OFFICIAL PHOTOGRAPH NO. 8 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 23, 2014

**Photo Number:** Photo 8 Time: 13:08

**Orientation:** Facing Southwest

**Photographer:** CJ Roebuck

**Subject:** Surface water collection location SMSSW03. This location was located East of the site, and needed to

be hiked to for access. The location was completely dry and not sampled, although there was evidence

of where water had previously flowed, it had apparently been dry for quite some time.

### J.M. Waller Associates, Inc. RAC II Lite, Region IV, Photo Log



### OFFICIAL PHOTOGRAPH NO. 9 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 24, 2014

**Photo Number:** Photo 9 Time: 08:55

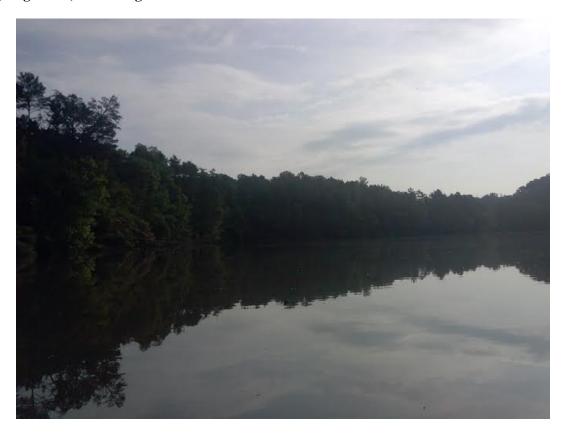
**Orientation:** Facing Southwest

**Photographer:** Alex Simpson

Subject: Location found at Knob Creek Embayment in I.C. King Park. Surface water collection location

SMSSW10. Met Lee Barron with Tennessee State Department for boat and access to location.

Embayment found southwest of the site.



## OFFICIAL PHOTOGRAPH NO. 10 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 24, 2014

**Photo Number:** Photo 10 **Time:** 09:14

**Orientation:** Facing Southwest

**Photographer:** Alex Simpson

Subject: Location found at Knob Creek Embayment in I.C. King Park. Surface water collection location

SMSSW20. Met Lee Barron with Tennessee State Department for boat and access to location.

Embayment found southwest of the site.



# OFFICIAL PHOTOGRAPH NO. 11 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 23, 2014

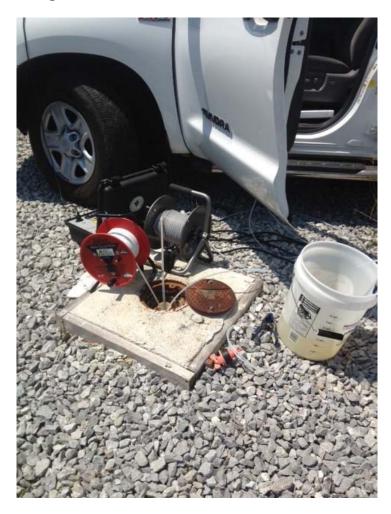
**Photo Number:** Photo 11 **Time:** 09:15

**Orientation:** Facing North

**Photographer:** Stan Thompson

**Subject:** Monitoring well SMSMW7A taken before sampling. This well is located on the southwest side of the

site.



## OFFICIAL PHOTOGRAPH NO. 12 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 23, 2014

**Orientation:** Facing Northwest

**Photographer:** Stan Thompson

**Subject:** Onsite monitoring well location SMSMW7B, located on the southwest side of the site. Photograph

taken during sampling.



### OFFICIAL PHOTOGRAPH NO. 13 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 23, 2014

**Photo Number:** Photo 13 Time: 14:25

**Orientation:** Facing North

**Photographer:** Stan Thompson

**Subject:** Onsite monitoring well location SMSMW11A, located on the southwest side of the site, along the tree

line. Photograph taken before sampling well.



### OFFICIAL PHOTOGRAPH NO. 14 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 23, 2014

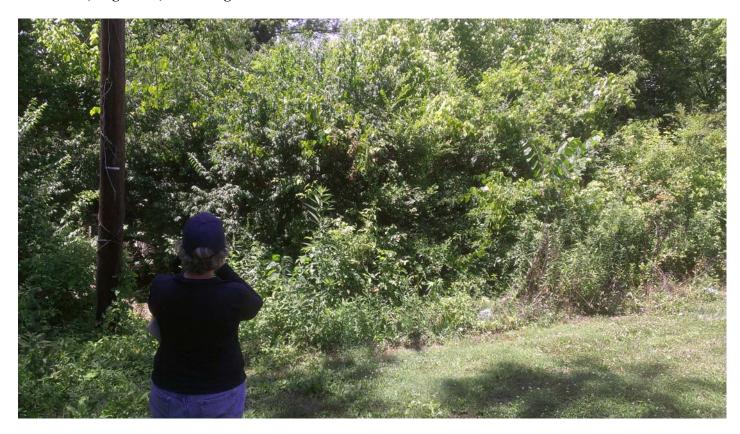
**Photo Number:** Photo 14 Time: 13:15

**Orientation:** Facing North

**Photographer:** Andrew Grimmke

Subject: Photograph of monitoring wells 12A (back-right) and 12B (front-left) at Smokey Mountain Smelters

site during sampling. Wells are located on the west side of the site, along the tree line.



### OFFICIAL PHOTOGRAPH NO. 15 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 22, 2014

**Photo Number:** Photo 15 Time: 14:25

**Orientation:** Facing Northwest

**Photographer:** Andrew Grimmke

Subject: Soil Vapor location SMSSV14, Linda Nyland pictured. Location behind apartment community

Montgomery Village, which is located on the east side of the site, on the other side of the Norfolk-

Southern Railroad.



### OFFICIAL PHOTOGRAPH NO. 16 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 22, 2014

**Photo Number:** Photo 16 Time: 14:26

**Orientation:** Facing North

**Photographer:** Andrew Grimmke

Subject: Recon of soil vapor location SMSSV14 and SMSSV15. Soil vapor detection summa canisters set up

along tree line behind apartment community Montgomery Village.



OFFICIAL PHOTOGRAPH NO. 17 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 24, 2014

**Photo Number:** Photo 17 **Time:** 12:02

**Orientation:** Facing North

**Photographer:** Andrew Grimmke

Subject: Photograph features taking a groundwater sample at SMSSVGW13 located at soil vapor location

SMSSV13, a Geoprobe 6620 DPT rig was provided by subcontractor Bear Environmental pictured, as

well as set up for sampling groundwater location 13.



OFFICIAL PHOTOGRAPH NO. 18 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 24, 2014

**Photo Number:** Photo 18 Time: 15:46

**Orientation:** Facing Southeast

**Photographer:** Andrew Grimmke

Subject: Advancing soil vapor location SMSSV10, Geoprobe 6620 DPT rig provided by subcontractor, Bear

Environmental, pictured. Street pictured is Caleb Avenue, west of the site.



OFFICIAL PHOTOGRAPH NO. 19 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 24, 2014

**Photo Number:** Photo 19 Time: 16:43

**Orientation:** Facing East

**Photographer:** Andrew Grimmke

**Subject:** Collecting soil vapor using summa canister and shroud at location SMSSV10, Geoprobe 6620 DPT rig

provided by subcontractor Bear Environmental pictured. Located on Caleb avenue, west of the site.



OFFICIAL PHOTOGRAPH NO. 20 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 25, 2014

**Photo Number:** Photo 20 Time: 09:44

**Orientation:** Facing South

**Photographer:** Andrew Grimmke

**Subject:** Preparing soil vapor location SMSSV8 with paste made from distilled water and bentonite, this is

applies around the Teflon tubing to create an airtight seal for purging and sample collection. Driller

with subcontracting company Bear Environmental picture with Geoprobe 6620 DPT rig.



OFFICIAL PHOTOGRAPH NO. 21 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 25, 2014

**Photo Number:** Photo 21 Time: 09:57

**Orientation:** Facing Southwest

**Photographer:** Andrew Grimmke

Subject: Testing location SMSSV8 for leaks using PID prior to sampling soil vapor. Location next to

monitoring wells SMSMW13A and SMSSW13B on the east side of the site.



### OFFICIAL PHOTOGRAPH NO. 22 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 25, 2014

**Orientation:** Facing Northwest

**Photographer:** Andrew Grimmke

Subject: Testing at location SMSSV13 for leaks prior to sampling soil vapor with PID, Geoprobe 6620 DPT rig

provided by Bear Environmental also pictured. Location to the southwest side of the site next to the

CSX railroad, along the tree line.



### OFFICIAL PHOTOGRAPH NO. 23 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 25, 2014

**Photo Number:** Photo 23 Time: 12:40

**Orientation:** Facing Northwest

**Photographer:** Andrew Grimmke

Subject: Collecting sample at SMSSV13, picture has summa canister with transfer shroud for soil vapor

collection purposes. Location to the southwest side of the site next to the CSX railroad, along the tree

line.



## OFFICIAL PHOTOGRAPH NO. 24 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 25, 2014

**Photo Number:** Photo 24 Time: 13:44

**Orientation:** Facing North

**Photographer:** Andrew Grimmke

Subject: Collecting sample at SMSSV11 using shroud and summa canister, Geoprobe 6620 DPT rig provided

by Bear Environmental also pictured. Location on the east side of the CSX railroad, on the west side

of the site.



### OFFICIAL PHOTOGRAPH NO. 25 U.S. ENVIRONMENTAL PROTECTION AGENCY

**Location:** Smokey Mountain Smelters Site **Date:** June 25, 2014

**Photo Number:** Photo 25 Time: 16:15

**Orientation:** Facing South

**Photographer:** Andrew Grimmke

Subject: Drillers from subcontractor Bear Environmental pictures installing shroud at soil vapor location

SMSSV10 to prepare for sampling. Sampling location on north side of Caleb Avenue, north of the

site.